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Shrunk the Equity Premium:
Asset Allocation in a Higher-Rate World**

Thomas Maloney





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Honey, the Fed Shrunk the Equity Premium: Asset Allocation in a Higher-Rate World

Thomas Maloney

Thomas Maloney
is a managing director at
AQR Capital Management in
London, UK.
thomas.maloney@aqr.com

KEY FINDINGS

- Equity markets have historically delivered smaller excess returns when cash rates are higher, consistent with yield-based return forecasts that indicate the equity risk premium shrank between 2021 and 2024.
- Private assets have exhibited similar patterns as equities, whereas liquid alternatives—which tend to maintain substantial cash holdings—have delivered similar excess returns in higher- and lower-rate environments.
- If all assets' expected returns moved in parallel with cash rates, higher cash rates would make for easier investing. But history leads us to expect different responses from different asset classes, with cash-plus liquid alternatives gaining a relative advantage.

ABSTRACT

The future path of interest rates is highly uncertain, but we can at least be fairly confident that the level of rates will be substantially higher in the medium term than it has been in recent decades—in the United States and many other major economies. What, if any, are the implications for asset allocation? Does a higher-cash-rate tide lift all asset return boats? This article presents a simple empirical analysis covering stocks, bonds, and alternative investments and compares those historical patterns to yield-based expected returns as of early 2024. One result is clear: Equity markets have earned slimmer excess returns on average when the cash baseline is higher. The author discusses the role of so-called cash-plus liquid alternative strategies—overlooked beneficiaries of higher cash rates—and concludes with a simple allocation case study. In a higher-rate world that investors haven't seen for many years, diversification away from equities may prove to be especially valuable.

During 2022 and 2023 the federal funds rate rocketed above 5% after averaging just 0.5% from 2010 to 2021. Other major economies saw similarly dramatic policy rate changes (with the notable exception of Japan). Since then, many investors have been pondering the implications for their portfolios.

But investors can't control the risk-free rate. Their job is to beat it—to earn excess returns—by taking investment risk. Should the level of the risk-free rate itself impact their asset allocation decisions? There are two ways that it might:

1. If excess-of-cash returns of assets and strategies depend on the risk-free rate in some systematic way, then optimal allocations will too.
2. Even if expected excess returns stay the same, constrained investors may face different trade-offs when the cash rate changes. For example, in a

low-rate environment, investors might have to compensate by increasing equity allocations. When the cash baseline is higher, they might find they can hit the same return objective with a more diversified portfolio.

In this article, we focus on point 1, although we also examine the implications of point 2 near the end.

According to the capital asset pricing model, a stock's required excess return is the *equity market risk premium*—the expected return of the equity market in excess of the risk-free rate, multiplied by the stock's beta. The equity risk premium cannot be measured directly, but there is an extensive empirical literature attempting to explain its variation, with interest rates among the many different variables considered. In most studies, a high interest rate (especially relative to recent history) has been found to predict a low equity premium on average, and vice versa, although interpretations and estimates of economic and statistical significance vary.¹ We reexamine the evidence using simple regime-based tests.

What about the *bond risk premium*? Here, too, there is an extensive literature, often focusing on the role of the shape of the yield curve.² Flat or inverted curves, which have tended to occur when the short rate is high compared to its recent history (as in 2023), signal lower carry for bonds but have also preceded recessions and falling rates. We test the resulting relationship between short rates and bond returns.

Finally, what are the relationships between interest rate levels and *alternative investments*? This article's main contribution is to combine established results for traditional assets with more novel findings for illiquid assets and cash-plus liquid alternatives. Which strategies deserve that promising cash-plus appellation, and why? We explore the implications for asset allocation, partly to address the commonly held—but misguided—belief that a higher-rate environment strongly favors bonds over liquid alternatives.

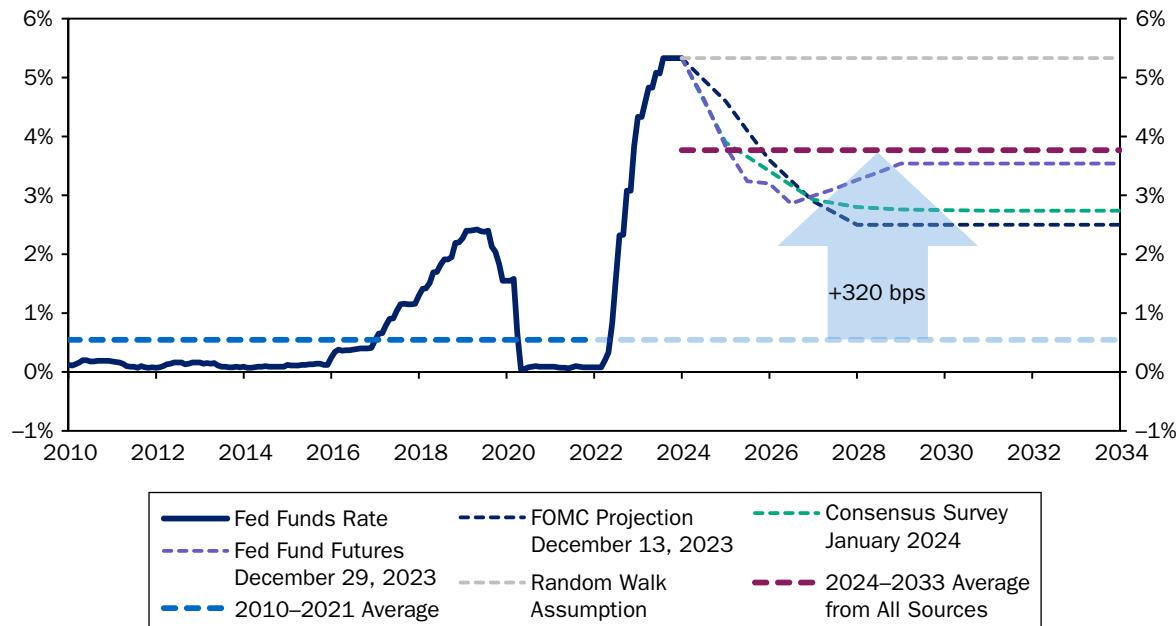
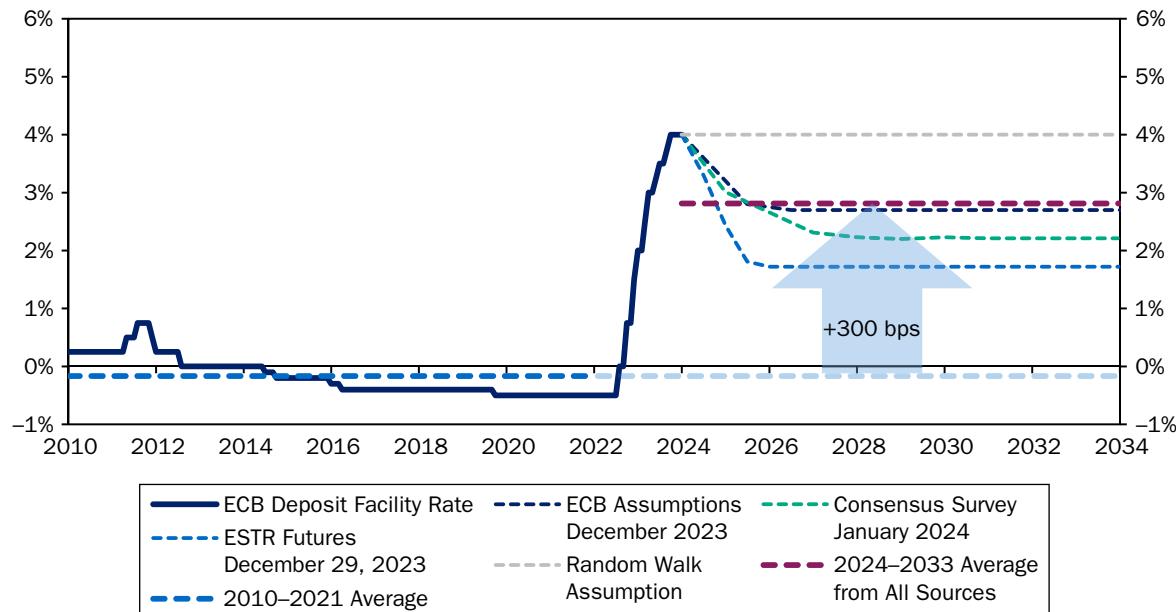
The rest of the article is organized as follows. The first section considers the interest rate outlook in major markets. The second section analyzes historical asset return sensitivities. The third section discusses liquid alternative strategies with large cash holdings, and the role of cash hurdles when charging performance fees. The fourth section considers forward-looking return estimates based on market yields. The fifth section presents a simple asset allocation case study. The last section concludes.

RATES OUTLOOK: HIGHER FOR HOW LONG?

The path of interest rates is difficult to forecast, especially during times of heightened policy uncertainty such as 2024. After a large change in rates, commentators often debate how long the new level might be sustained and whether there might be a “new normal.” But markets, economists, and central bankers usually answer with a firm “no” to this question and forecast a fairly rapid reversion to some perceived equilibrium rate. The 2020s episode appears no different, with markets and forecasters expecting a fairly rapid reversion to lower interest rates. Exhibit 1 shows policy rates for the United States and eurozone, along with various projections.

¹For a succinct recent treatment focusing on the interest rate level specifically, see Blitz (2022). Older but influential analyses include Goyal and Welch (2008) and Campbell and Thompson (2008). Blanchett (2022) examines the impact of bond yields rather than short rates, but the findings are consistent with a smaller equity risk premium in a high-rate environment.

²Influential articles include Fama and Bliss (1987) and Cochrane and Piazzesi (2005). In Mendelson et al. (2017), the authors stress the importance of considering excess returns and not yield levels when judging the attractiveness of bonds in asset allocation. A flatter or inverted yield curve has predicted lower near-term excess returns for both bonds and equities on average, although with a wide range of outcomes.

EXHIBIT 1**A Step Change in Rates, Even If Expected Cuts Materialize****Panel A: Federal Funds Rate and Various Projections, January 2010–December 2023****Panel B: ECB Rate and Various Projections, January 2010–December 2023**

NOTE: Furthest available projections are extended to end of period where necessary.

SOURCES: Federal Reserve, European Central Bank (ECB), Consensus Economics, Bloomberg.

Historically, sometimes mean reversion did occur rapidly (as after the short-lived early 1990s' and early 2000s' interest rate troughs), and sometimes it took much longer than the market expected (as after the Global Financial Crisis). In this article we are not taking a view on whether the market's interest rate expectations are too low or too high.³ We don't need to, because regardless of whether or how quickly rates fall, it's almost certain that the average level of rates will be substantially higher over the next 5 to 10 years than it was during the past decade or the one before. Specifically, the average across all forecasts in Exhibit 1 is for the federal funds rate to average 320 bps higher in the 10 years after the 2022–2023 episode than the 12 years before (blue arrow). For the eurozone the equivalent gap is 300 bps (380 bps for the United Kingdom). That's probably enough for investors to consider strategically repositioning their portfolios for a higher-rate world.

HISTORICAL PATTERNS

Testing return sensitivities to the level of interest rates is problematic because, unlike changes in rates, levels are highly persistent. Truly independent observations are few, even over long histories. But some historical patterns are so strong they demand our attention. In the following, we first examine a long dataset of traditional assets and then a shorter, broader one that includes alternatives. In each case, we use three different methods to define lower- and higher-rate regimes:

1. *Full-sample categorization*: We divide the sample into rates above and below the median. This method is simple and intuitive but tends to result in a few prolonged episodes of each environment and therefore a small number of independent observations for our analysis.
2. *Rolling categorization (trailing window)*: Here we compare each observation to the trailing five-year period to detrend the series and identify more episodes of locally higher and lower rates.⁴
3. *Rolling categorization (centered window)*: Here we compare each observation to the five-year period centered upon it. We include this centered method because, unlike a trailing window, it is not biased toward periods of rising rates—and here we want to test sensitivity to levels, not changes.

We focus on a binary higher/lower analysis because it is well-suited to evaluating the impact of seismic shift that occurred during 2022 and 2023, from an environment of ultra-low rates to something very different. We also state the results of continuous regression analysis and more-granular quantile approaches.

Long Dataset

For the interest rate, we use monthly US three-month T-bill rates from the Federal Reserve since 1934, extended back to 1926 using short rates from Global Financial Data. Over this 98-year period, we study three major US asset class returns: US equity and Treasury bond returns from Global Financial Data and corporate credit

³We do include a random walk assumption with one-fourth weight in our average of forecasts in Exhibit 1, as an acknowledgment that future interest rate moves and the timing of any mean reversion are hard to forecast.

⁴To avoid unintuitive categorizations in the rolling methods, we define all rates of less than 0.5% as low. Because of this constraint, for the rest of the sample, we shift the lower/higher threshold from the median to the 40th percentile to ensure approximately equal numbers of higher and lower observations. The main patterns are not sensitive to these choices.

returns in excess of empirically duration-matched Treasuries from Asvanunt and Richardson (2017). Exhibit 2 shows the T-bill rate and the regimes defined using the three methods previously described. The different shades show how many of the three rules indicate a higher-rate environment. Although the full-sample categorization is dominated by the interest rate mountain of the 1970s and 1980s, rising between the plains of the 1930s–40s and the 2010s, the other rules identify many more episodes of locally higher and lower rates, as intended. The last observation, December 2023, is classified as *higher rates* by all three regime rules.

Exhibit 3 shows annualized average returns for the three asset classes starting in each regime, over three different horizons, averaged across the three regime rules (see the appendix for more granular results). The good news for allocators is that all three have delivered positive premiums in both regimes over a range of horizons (Panel A). But premiums have not been constant. For all three asset classes and at all horizons—and most dramatically for equities—risk premiums have been smaller when starting cash rates are higher.

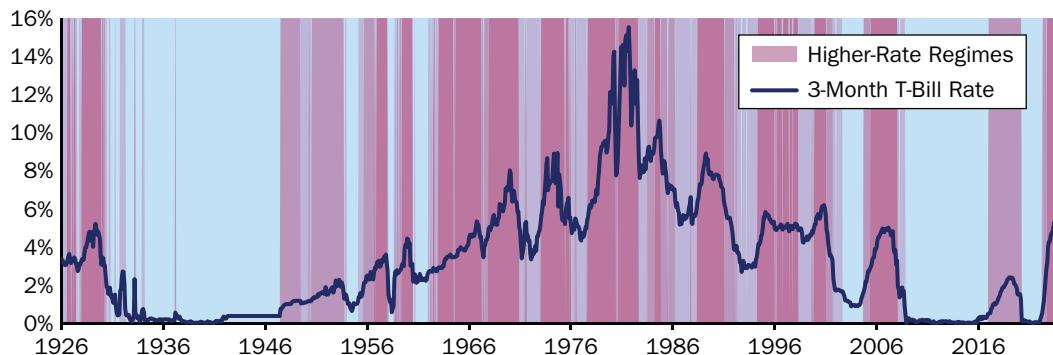
Panel B adds the prevailing cash rates and averages across the three horizons to summarize the impact on total nominal and real returns. Bonds have earned somewhat higher total returns in higher-rate regimes, albeit with slimmer risk premiums. But for equities, total nominal and real returns have actually been lower, not higher, when starting cash rates are higher. The average rate of inflation has been around 1% higher when starting from a higher interest rate, making the downward gradient for equity real returns (right chart) especially steep.

One reason for testing different horizons is to see whether, when starting from a higher-rate regime, more-attractive equity excess returns might materialize over multiyear horizons—perhaps because of cheaper starting valuations. Well, they don't. We discuss the interaction with valuation later.

There are, of course, other ways to measure sensitivity to the level of rates. We can perform a more granular quantile analysis by dividing interest rate observations into a larger number of buckets. This gives directionally similar (but not always monotonic) patterns. A simple regression of monthly excess returns on starting interest rate levels produces a statistically significant negative relationship for equities and credit (*t*-statistics of -2.2 and -2.4, respectively), but not for Treasuries. These measures of statistical significance, however, are questionable given the persistence of interest rate levels (observations are not serially independent).

EXHIBIT 2

(Almost) a Century of Interest Rate Regimes, January 1926–December 2023

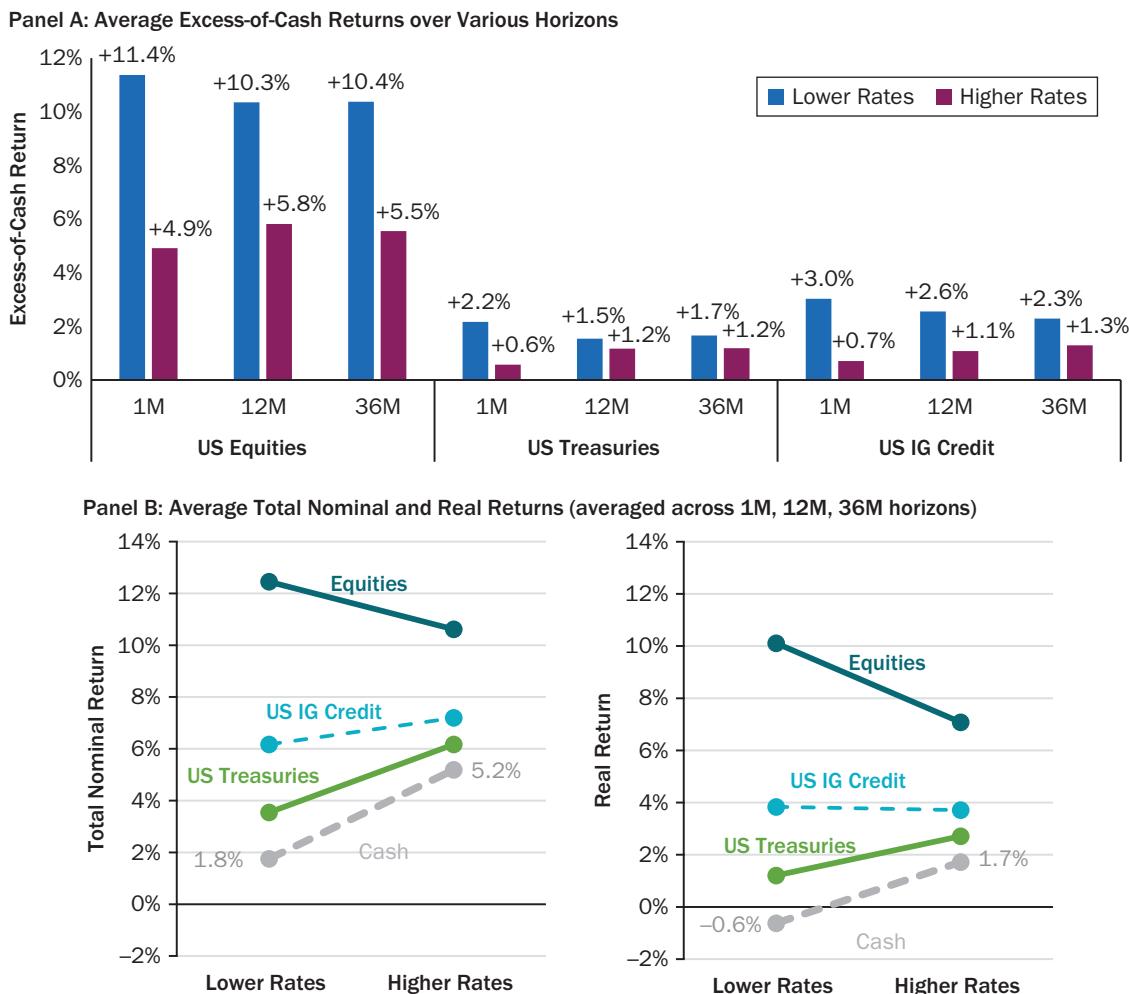


NOTES: Regimes are defined in the main text. Different shades show how many of the three rules indicate a higher-rate environment.

SOURCES: Federal Reserve, Global Financial Data.

EXHIBIT 3

Leaner Compensation for Risk When Cash Rates Are High, January 1926–December 2023



NOTES: Results shown are the average across the three rules described previously (see appendix for breakdown). Cash is US three-month T-bill. For US IG Credit, Panel A shows excess-of-Treasury return and Panel B shows credit excess return plus corresponding Treasury nominal or real return.

SOURCES: Federal Reserve, Global Financial Data, Asvanunt and Richardson (2017), Bloomberg.

Economic drivers. We can have more confidence in the broad empirical pattern if it agrees with economic intuition. Why might the equity premium shrink when interest rates are high? Blitz (2022) considers explanations related to risk, multiple expansion, and fundamentals, and favors the last—that is, when rates are higher, firms have not generated sufficiently higher earnings to deliver higher returns and thus maintain a constant premium. In our analysis, risk explains part of the difference for equities: Volatility averages 19.4% after a low interest rate but only 17.4% after a high interest rate, justifying a slightly lower excess return. But the risk-adjusted return is still much higher after a low interest rate (Sharpe ratio 0.57 versus 0.31), suggesting a fundamental driver. We test for this directly using US real earnings-per-share data from Robert Shiller's data library. Over the same 1926–2023 period, annualized real earnings-per-share (EPS) growth was a blistering 11% when starting from a low interest rate, but only 1% when starting from a high interest rate (these are arithmetic means);

the geometric means are 5.8% and –1.1%, respectively).⁵ Intuitively, it is low interest rates that stimulate demand and facilitate business financing and expansion. Regardless of the underlying driver, these patterns may make for tougher investing when rates are high, with implications for asset allocation.

Interactions with Other Factors

The previous analysis considers only one variable—the level of the interest rate—although it is more likely there are several interacting variables driving risk premiums. For example, the best-known predictors of equity excess returns relate not to interest rates but to valuation. During higher-rate environments, the equity market has tended to be cheaper (as measured by the Shiller or cyclically adjusted price-to-earnings ratio [CAPE]—see Exhibit 4, Panel A). This means that when we control for valuations, the relationship with interest rates gets even stronger. In a monthly two-factor regression that includes the T-bill rate and the inverse of the CAPE, loadings on both predictors are highly significant (*t*-statistics of –3.2 and +3.9, respectively). When rates and valuations are both high together—as in early 2024—subsequent equity returns have tended to be particularly low (Exhibit 4, Panel B).⁶

Another interacting factor is the change in interest rates. Historically, equity markets have tended to underperform during episodes of rising rates (i.e., tightening monetary policy). But when starting rates are high, they are more likely to fall than to rise further. On average, starting from a higher-rate regime as defined by our three rules, the T-bill rate fell 27 bps over the next 12 months, and 73 bps over the next 36 months. Starting from a lower-rate regime, the corresponding average changes were increases of 29 bps and 63 bps, respectively. If we control for the impact of these rate changes, the negative relationship between the starting level of rates and the subsequent equity excess return gets even stronger.

Broad Dataset

For investors, the natural next question is, Do some investments offer more resilient premiums in the face of higher interest rates? To answer this, we examine a shorter, broader dataset. Our broad dataset begins in 1990 so that we can add real estate, private equity, and liquid alternatives (represented by hedge fund indexes) to our analysis. We apply the same categorization rules as before, but the regimes look a little different, as shown in Exhibit 5, because rates were generally lower during this 34-year period.

Exhibit 6 shows average returns in each regime for traditional and alternative assets.⁷ Equities and credit follow the same pattern as before—much slimmer premiums when rates are higher—which is also clearly seen for private equity and real estate. Treasuries fared better during this sample, even earning a slightly higher premium from higher starting rates. This post-1990 period was characterized by generally declining rates and repeated downside rate surprises that boosted bond returns, especially after periods of higher rates.

⁵This risk and earnings analysis is averaged over 1-, 12-, and 36-month horizons. The reported patterns are directionally similar at all horizons.

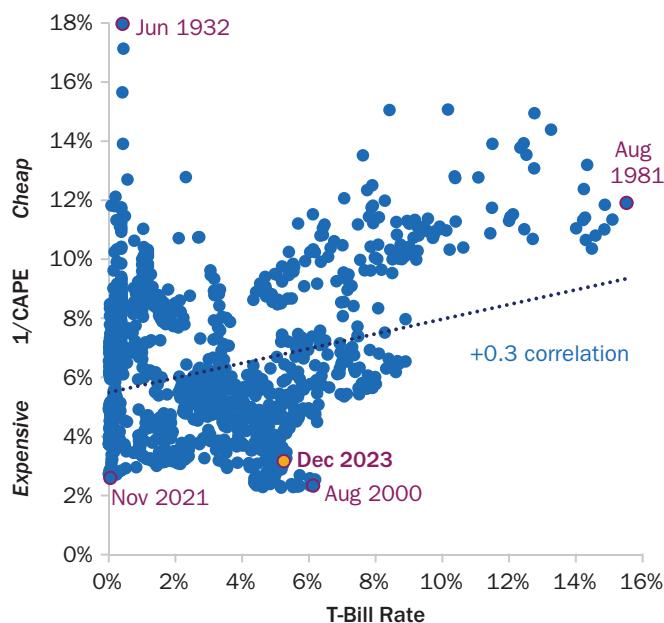
⁶And yet, market timing is difficult. The negative equity premium implied in Exhibit 4, Panel B as of end-2023 is probably exaggerated by the use of an in-sample regression. Later we see that a yield-based expected return framework implies a positive if uninspiring premium in 2024.

⁷For the rolling-regime definitions, we reduce the higher/lower threshold from the 40th to 30th percentile for this sample to maintain similar numbers of higher and lower observations. Because of space limitations, we average across the 1-, 12-, and 36-month horizons here, as well as across the three regime definitions. Results are directionally similar across horizons, across regime definitions, and if we reuse the regime boundaries from the long dataset instead of recalculating them for this shorter sample. We also tested commodities, which showed mixed results over different horizons.

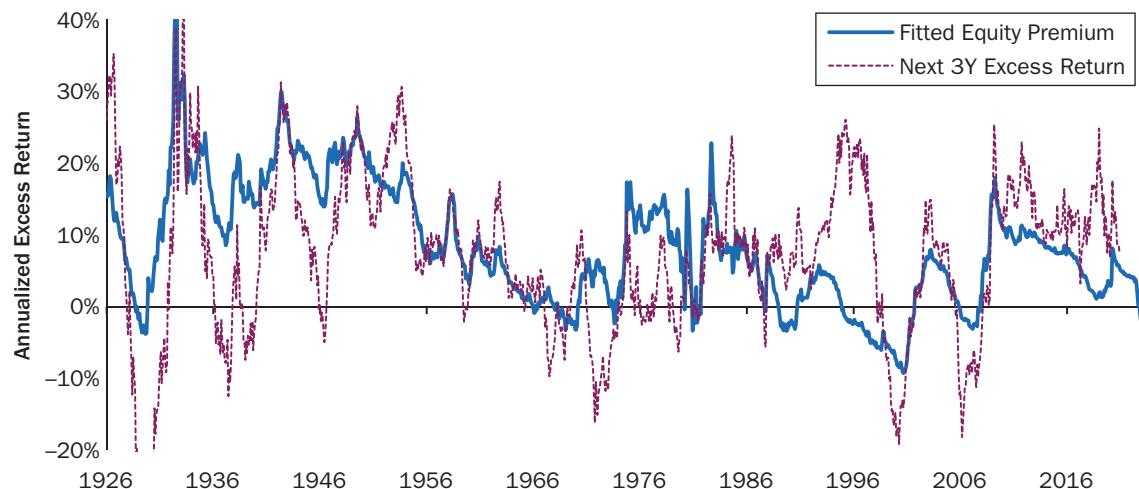
EXHIBIT 4

High Rates and High Valuations: Toxic Combination?

Panel A: T-Bill Rate vs. CAPE Valuation for US Equities, January 1926–December 2023



Panel B: Fitted Premium Based on T-Bill Rate and Valuation, January 1926–December 2023



NOTES: US equities are S&P 500 Index. Fitted premium in Panel B is based on 1/CAPE and T-bill rate coefficients in full-sample regression with monthly data. Dashed line shows subsequent three-year annualized excess-of-cash return.

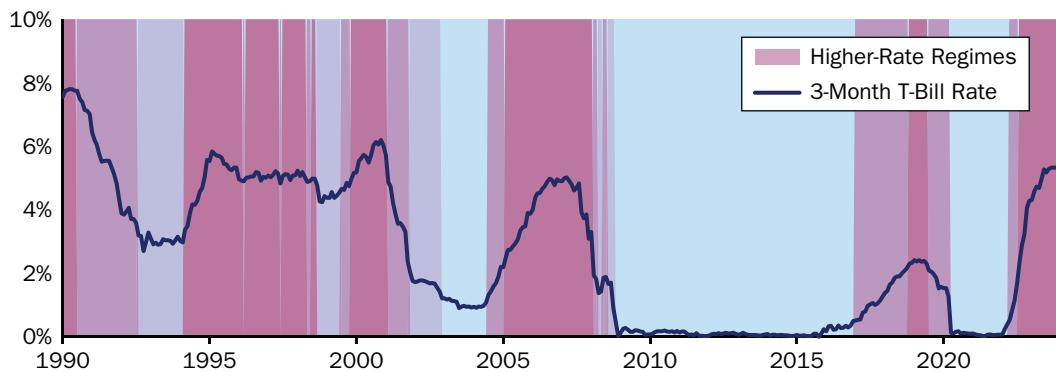
SOURCES: Global Financial Data, Federal Reserve, Robert Shiller data library.

Liquid alternatives' sensitivities are particularly interesting. We chose equity market-neutral and trend-following strategies because both have exhibited near-zero equity beta over the long term, and both tend to maintain large cash holdings. They were able to generate comparable excess returns in both environments, so their average total returns were substantially higher in the higher-rate regimes: They delivered on their cash-plus objective.⁸

⁸We also tested broad hedge fund indexes, which inherit some of equities' preference for lower rates—not surprising given their well-known passive beta exposure.

EXHIBIT 5

Defining Interest Rate Regimes since 1990, January 1990–December 2023



NOTES: Regimes are defined as described in the main text. Different shades show how many of the three rules indicate a higher-rate environment.

SOURCE: Federal Reserve.

UNDERSTANDING CASH-PLUS STRATEGIES (AND THEIR FEES)

It should be no surprise or mystery that some hedge fund or liquid alternative strategies are able to earn similar excess-of-cash returns whether rates are low or high and pass higher cash rates on to investors—for two reasons. First, these strategies literally invest in Treasury bills and other cash instruments alongside their active positions. Second, any return impact from higher rates on the (long and short) active positions will tend to cancel out. Ilmanen, Maloney, and Ross (2014) find that long–short alternative risk premiums—which are the excess return drivers of many liquid alternative strategies—have tended to exhibit milder macroeconomic sensitivities than traditional asset classes, including to the interest rate environment.

There are two different mechanisms by which liquid alternatives are able to maintain large cash holdings alongside their active positions. Some strategies employ a combination of both techniques:

1. Financing of long positions by short positions of comparable size: employed by long–short equity portfolios and especially market-neutral strategies, in which proceeds from shorts are sufficient to fund most of the portfolio's long positions. The portfolio earns cash returns plus active performance (longs minus shorts) minus financing spreads.
2. Use of derivatives to gain economic exposures: typically employed by macro strategies such as trend following, but also some equity portfolios. Even as long and short exposures change, most invested assets are maintained as unencumbered cash, and the posted margin also earns cashlike returns.

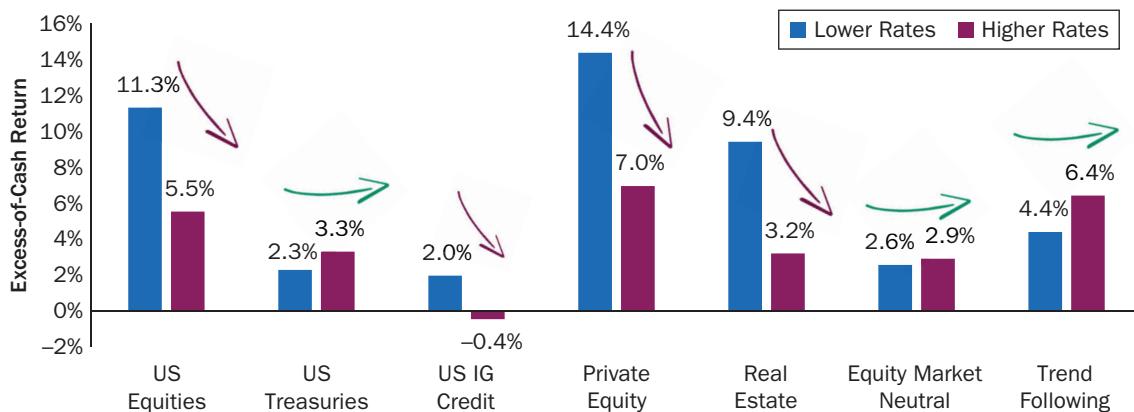
Money for Old Rope? A Word on Fees

Some hedge funds charge performance fees on their total returns. In other words, they charge performance fees simply for holding those risk-free cash instruments alongside their active bets and collect higher fees when interest rates are higher. This dilutes their usefulness as diversifiers to slimmer premiums on risk assets in these environments, and their investors are effectively paying hedge fund fees for returns they could get in a money market account. Put differently, they are paying a

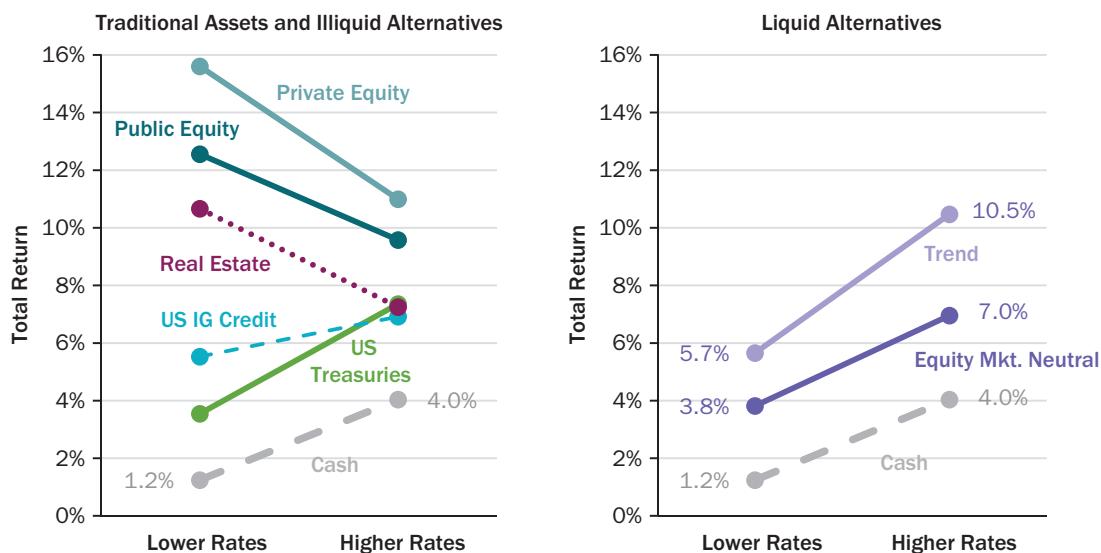
EXHIBIT 6

Which Investments Maintained Their Edge over Cash, January 1990–December 2023

Panel A: Average Excess-of-Cash Returns (averaged across 1M, 12M, 36M horizons)



Panel B: Average Total Returns (averaged across 1M, 12M, 36M horizons)



NOTES: Results shown are the average across the three rules described previously, and the average across 1-, 12-, and 36-month horizons. Cash is US three-month T-bill. For US IG Credit, Panel A shows excess-of-Treasury return, and Panel B shows credit excess return plus corresponding Treasury return.

SOURCES: Federal Reserve, Bloomberg.

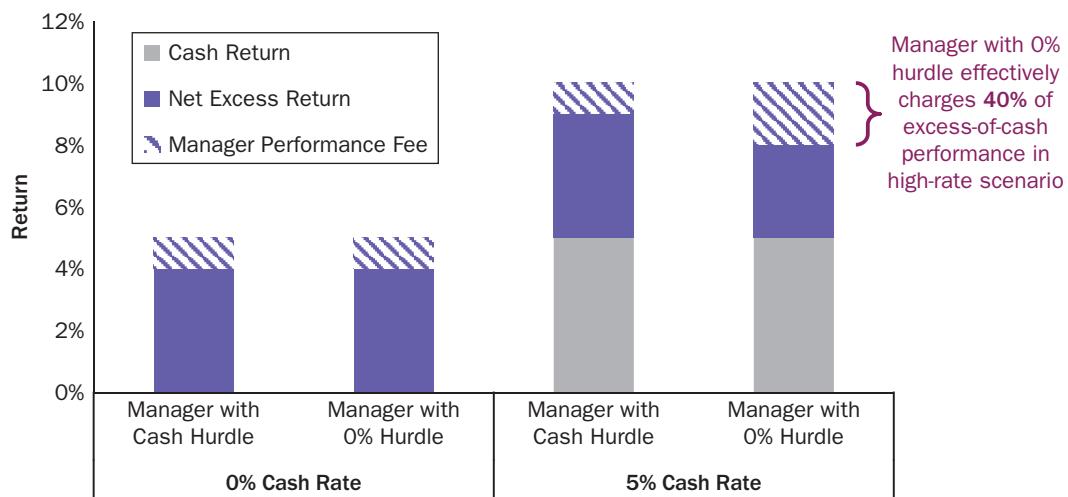
much higher percentage of excess returns when cash rates are high than when they are low, as illustrated in Exhibit 7. Where cash-plus strategies charge performance fees, they should be on returns above a cash benchmark, just as long-only managers are evaluated against an appropriate market benchmark.

CONSULTING YIELD-BASED EXPECTED RETURNS

In an earlier section we reviewed the historical evidence on realized excess returns in higher- and lower-rate environments, which was not encouraging for equities, credit, and illiquid assets given the sharply higher rates outlook for the 2020s. We can also

EXHIBIT 7

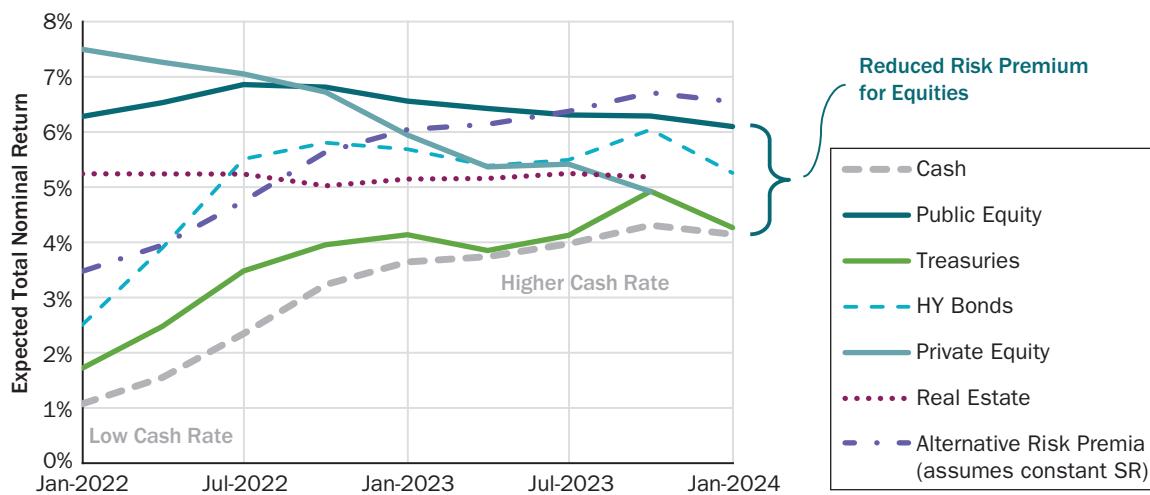
Illustration of Fees Charged by Two Liquid Alternative Managers with Different Performance Hurdles



NOTE: Illustration assumes 5% gross excess return, 20% performance fee, and 0% management fee for both managers.

EXHIBIT 8

Expected Returns before and after the Rise in Cash Rates: Yield-Based Total Returns for US Asset Classes, December 31, 2021–December 31, 2023



NOTES: Quarterly estimates are total nominal annual compound rates of return with a 5- to 10-year horizon. Latest private equity and real estate estimates are for September 30, 2023, because of data availability. Alternative risk premiums are based on long-term expected industrywide Sharpe ratio of 0.36 and 7.3% volatility.

SOURCES: AQR Capital Management (2024). Bloomberg, Consensus Economics.

consult forward-looking yield-based estimates of expected returns to see if they corroborate the story of slimmer premiums for these assets.

AQR has published yield-based capital market assumptions for the past decade, including cash rate forecasts, with the full methodology described in an annual publication each January (and summarized in the appendix). The horizon is 5 to 10 years. Exhibit 8 plots the evolution of these estimates from year-end 2021 (when interest rates were near zero across major markets) to year-end 2023. Cash and fixed-income expected returns moved sharply higher, but equity and real estate expected returns

are little changed in the higher-rate environment, despite the rise in the riskless part of their discount rates, implying much slimmer risk premiums. Private equity expected returns actually fell as a result of higher financing costs combined with a lack of cheapening, implying an even bigger drop in premium.

These yield-based forecasts do indeed agree with the historical evidence⁹ and suggest the current episode of higher rates may follow the same pattern as previous episodes. Liquid alternatives don't lend themselves to yield-based return forecasts because positions are constantly evolving. Instead, Exhibit 8 shows expected returns based on a Sharpe ratio assumption, an approach supported by the results in the second section. So, as cash rates increased, expected returns for liquid alts increased by a similar amount—in stark contrast to equities.

ASSET ALLOCATION CASE STUDY

The implications of higher rates on asset allocation will be different for different investors, depending on objectives, constraints, and assumptions. In Exhibit 9 we present a single simplified allocation case study based on the assumption of similar long-term Sharpe ratios for major asset classes, adjusted for breadth. From left to right:

- We start with a theoretical unconstrained optimal allocation that maximizes risk-adjusted return (first column). This portfolio is broadly risk balanced (note the large notional bond allocation), but without the use of leverage it has low risk and low expected returns.
- We then consider a more typical constrained portfolio with a 3% real return target, in a low-return environment with a negative real cash return as seen in the 2010s (second column). This portfolio is forced to allocate more than half its capital (and nearly 75% of risk) to public and private equity to achieve its return target, with only a small bond allocation. This is consistent with empirical research suggesting investors hold larger risky asset allocations (reach for yield) when real riskless rates are low.¹⁰
- Finally, we consider two higher-rates optimal portfolios:
 - Scenario 1 assumes a 1% rise in expected real return for all assets (i.e., “a higher-cash-rate tide lifts all asset return boats”). The return target is now a less binding constraint, and the portfolio is free to diversify out of equities to a lower-risk allocation more similar to the unconstrained case.
 - Scenario 2 applies small Sharpe ratio penalties of -0.06 to public and private equity and real estate, and -0.03 to high yield, directionally consistent with evidence presented in the second and fourth sections. In this tougher environment, the portfolio must retain more higher-returning assets such as private equity (even though these have lower risk-adjusted returns). The liquid alternatives allocation is higher than in any of the other scenarios, because by delivering true cash-plus returns, liquid alternatives acquire a relative advantage over other return-seeking assets.¹¹

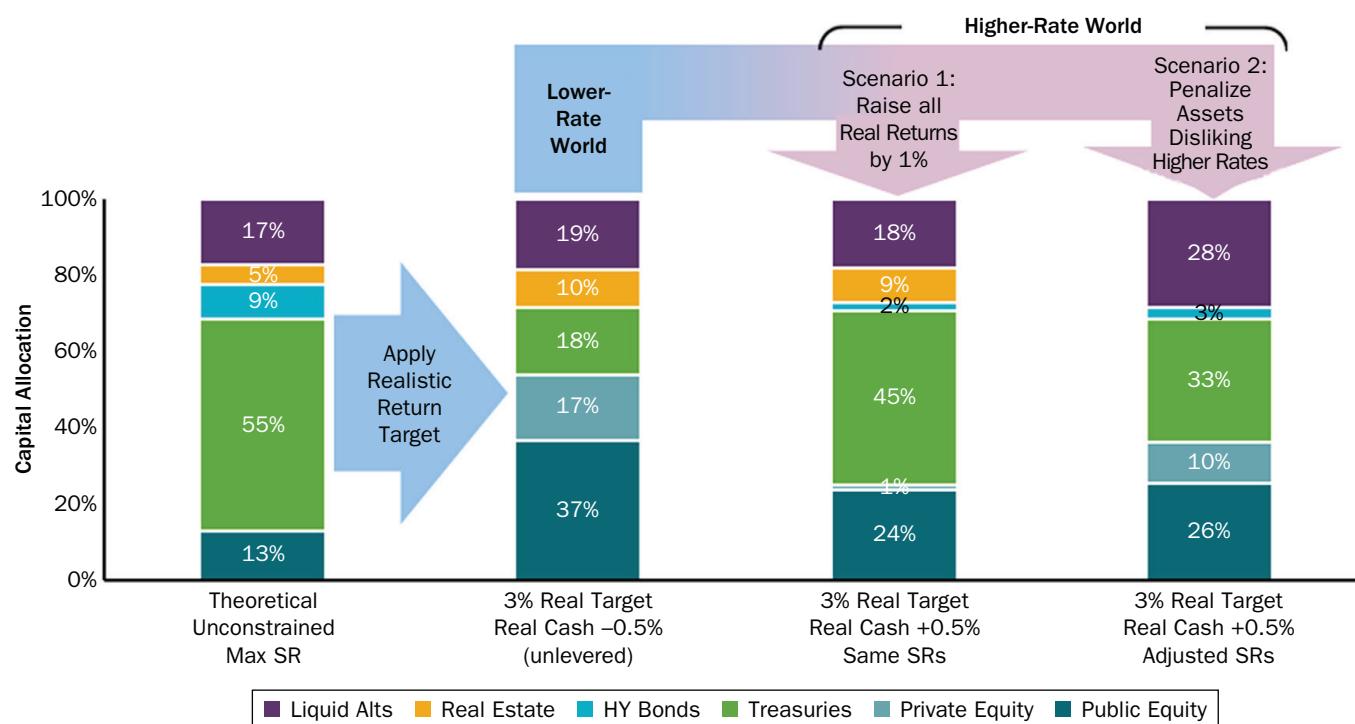
⁹ Not just in the 2020s, but over the long term, too. For equities, Treasuries, and cash, we have long histories of simple yield-based return estimates. From January 1926 to December 2023, the yield-based expected excess-of-cash return for equities averaged 4.2% in lower-rate environments, but only 2.3% in higher-rate environments. For Treasuries the corresponding premiums are 0.7% and 0.3%. So, results for realized and expected returns are broadly consistent.

¹⁰ See, for example, Hau and Lai (2016).

¹¹ The implied Sharpe ratio for the unconstrained portfolio is 0.45, dropping to 0.36 for the concentrated second portfolio. The third portfolio is back up to 0.44, whereas the fourth, with its gloomier but more-realistic assumptions, achieves a 3% real return with a Sharpe ratio of 0.35.

EXHIBIT 9

Optimal Capital Allocations under Different Assumptions and Constraints



Risk and Return Assumptions	Volatility	Normal Sharpe Ratio	Higher-Rate SR Adjustment	Public Equity	Private Equity	Treasuries	HY Bonds	Real Estate
Public Equity	15%	0.30	-0.06					
Private Equity	20%	0.275	-0.06	0.9				
Treasuries	5%	0.30		0.0	0.0			
HY Bonds	10%	0.275	-0.03	0.7	0.7	0.0		
Real Estate	10%	0.275	-0.06	0.5	0.6	0.2	0.6	
Liquid Alts	8%	0.25		0.2	0.2	0.2	0.2	0.2

NOTES: This exhibit shows maximum Sharpe ratio portfolios under various constraints and assumptions. Volatility and correlation assumptions are based on monthly historical proxy data from January 1990 to June 2023. Sharpe ratios are based on the assumption of 0.3 for major asset classes with adjustments for breadth.

Real investor objectives, constraints, and assumptions will differ, but under many different scenarios, a higher cash rate implies a higher allocation to liquid alternatives.

CONCLUSION

Growth and inflation are the main drivers of investment portfolios and have rightly been the focus of research in macroeconomic sensitivities.¹² But as the dust of the 2022 inflation shock settled in 2023, the most conspicuous transformation in the investment landscape was the level of interest rates. All else equal, a higher cash rate would be good news for investors, because it would allow them to meet return

¹² See, for example, Ilmanen, Maloney, and Ross (2014) and Brixton et al. (2023).

objectives with a better-diversified portfolio. But if history is any guide, all else isn't equal. Equities and illiquid alternatives have tended to underperform when cash rates are higher. Bonds have done a better job of passing the cash rate on to investors, and liquid alternatives have done best of all.

One note of caution: Market timing is difficult. Long-term historical patterns don't always persist, especially over shorter horizons. Tactical asset allocation decisions should be scaled according to conviction, and the interest rate level is just one of many potential predictors of excess returns. Strategic diversification is the best defense against changing macroeconomic conditions. But our analysis suggests there are some environments in which diversification away from equities is especially valuable. In particular, a higher-cash-rate environment makes cash-plus liquid alternatives more—not less—attractive.

APPENDIX

MORE-GRANULAR RESULTS

Exhibit A1 shows further breakdowns of results from Exhibits 3 and 6, plotting the excess return differences for the three different rules or definitions for categorizing higher and lower rates, as well as the three horizons. Results are broadly consistent across regime definitions and across horizons, with equity, credit, and illiquid asset excess returns smaller in higher-rate regimes for all definitions and at all horizons for both sample periods.

Methodology for Yield-Based Expected Returns in Exhibit 8

Public equity. Expected real return is the average of two different estimates. Earnings-based estimate is inverse of CAPE ratio (adjusted for earnings growth during 10-year CAPE window) multiplied by 0.5 payout assumption, plus 1.5% assumed real earnings-per-share growth. Payout-based assumption is dividend yield plus 10-year smoothed net buyback yield plus estimated aggregate payout growth (an average of smoothed historical aggregate earnings growth and forecast GDP growth). A survey-based estimate of long-term expected inflation is added to generate an expected nominal return.

Ten-Year Treasuries. Expected return is current yield plus rolldown.

High-yield bonds. Expected return is current spread haircut by 50%, plus duration-matched Treasury yield, plus Treasury and spread rolldown, plus convexity return minus variance drag.

Private equity. Unlevered real return is earnings yield (assumed to be half of earnings before interest, taxes, depreciation, and amortization to enterprise value yield [EBITDA-to-EV]) multiplied by 0.5 payout ratio, plus 3% assumed real growth. Levered real return is unlevered return plus the product of estimated leverage and the difference between unlevered return and the cost of debt, plus multiple expansion, minus estimated fees. A survey-based estimate of long-term expected inflation is added to generate an expected nominal return.

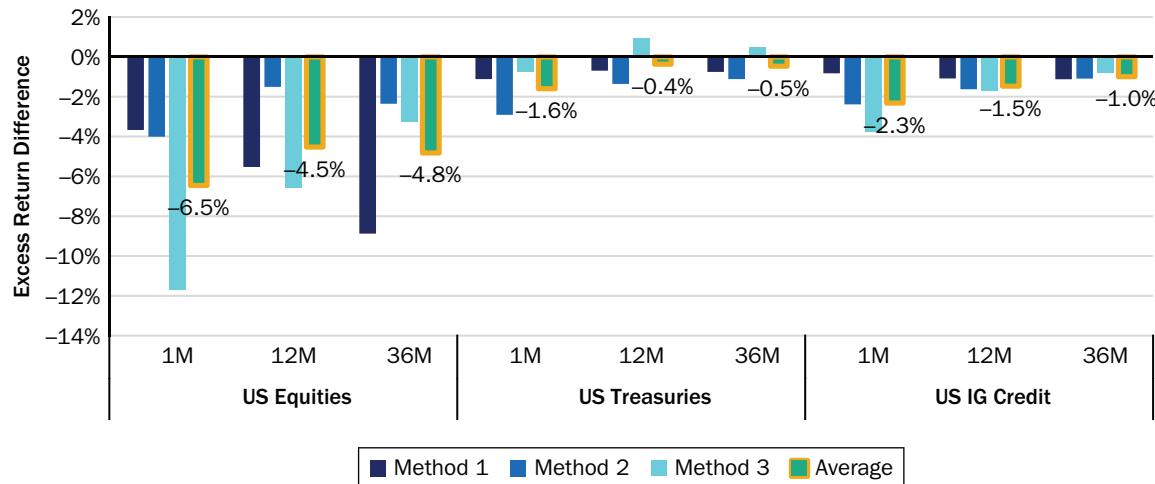
Real estate. Unlevered expected real return is net operating income multiplied by two-thirds to adjust for assumed capital expenditure. Real payout growth is assumed to be zero. A survey-based estimate of long-term expected inflation is added to generate an expected nominal return.

Cash. Expected cash return is the average of three inputs: current cash rate, current 10-year bond yield, and survey-based estimate of the next decade's average short-term interest rate.

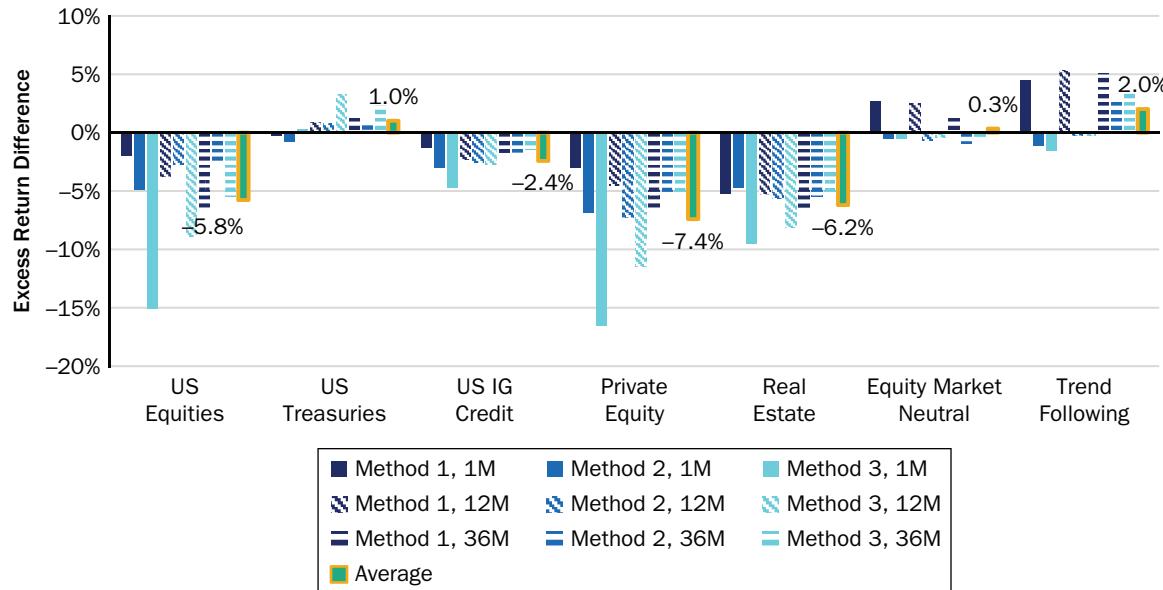
EXHIBIT A1

Excess-of-Cash Return Difference Breakdowns

Panel A: Long Dataset, January 1926–December 2023



Panel B: Broad Dataset, January 1990–December 2023



NOTES: This exhibit shows excess return in higher-rate regime minus excess return in lower-rate regime, for each asset class, horizon, and regime rule. Regime rules are described in the main text. Cash is US three-month T-bill.

SOURCES: Federal Reserve, Global Financial Data, Asvanunt and Richardson (2017), Bloomberg.

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