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Investing in Interesting Times

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KEY FINDINGS

- Expected asset returns rose in 2022 from extremely low levels, at least for bonds. Private asset valuations responded surprisingly little to a sharp rise in the riskless part of the discount rate, partly reflecting the popular return-smoothing feature.
- While both liquid stocks and bonds suffered, long–short strategies fared better. The value strategy, which had experienced large losses between 2018 and 2020, recovered and still looked attractive at the end of 2022.
- The dominance of equity market risk in many portfolios makes risk-mitigating strategies important complements. Trend following was the best-performing risk mitigator in 2022, reflecting the protracted nature of the market drawdown and heightened macro volatility.

ABSTRACT

What happened to major asset prices before 2022 and what changed in 2022? This article covers six key themes. 1) The backdrop of high asset valuations and low expected returns before 2022. 2) Investor responses to low expected returns, notably the boom in flows to private assets. 3) A revised picture after 2022: much higher expected returns at least for bonds (less for private assets so far) after the biggest inflation scare in a generation and central bankers' attempt to contain it. 4) Contrasting fortunes and prospects for long-only assets and long–short strategies. 5) Understanding the rollercoaster ride of value-versus-growth stock selection strategies. 6) The important role of risk-mitigating strategies, especially trend following, amid protracted bear markets and elevated macro volatility.

An old Chinese curse (possibly apocryphal) says, "May you live in interesting times." We certainly do. The year 2022 was pivotal and might go into history books as an even more important year than 2020 or competitors like 2016, 2008, and 2001. I will not discuss the huge geopolitical issues, such as war and reshoring, which of course contributed to economic and investment outcomes, but I will touch on the highest inflation for a generation and the central banks' response to it. Time will tell if this was a temporary blip or turns out to be the beginning of unanchored inflation expectations and prolonged macro volatility.

The focus of this Perspectives piece is on what happened to asset prices before 2022 and what changed in 2022. I finished my book *Investing amid Low Expected Returns* at the end of 2021, emphasizing how all asset classes had low starting yields (i.e., high valuations) compared with history. The almost inevitable outcome was low prospective returns, but we could not know whether this would materialize through a "slow pain" of clipping tiny coupons and dividends or a "fast pain" of cheapening asset prices.[1] In 2022, we clearly experienced some fast pain, but for many assets maybe not enough. Because the lowness of expected returns can be debated now, I choose to title this piece "Investing in Interesting Times."

I will cover six key themes:

1. the backdrop of high asset valuations and low expected returns before 2022;
2. investor responses to this low expected return challenge, notably the boom in flows to private assets;
3. what changed in 2022, a revised picture on expected returns for all asset classes and multi-asset strategies;
4. contrasting fortunes and prospects for long-only assets and long–short strategies;
5. understanding the rollercoaster ride of value-versus-growth strategies;
6. the importance of risk-mitigating strategies, especially trend following amid protracted bear markets and high macro volatility.

DECADES OF RISING ASSET VALUATIONS AND FALLING ASSET YIELDS

Exhibit 1 tracks the expected real returns of US stocks (S&P 500 Index) and bonds (10-year Treasury) since 1900 using simple yield-based metrics (Panel A), and the 60/40 stock/bond portfolio (Panel B). In Panel A, both asset classes were near their lowest-ever starting yields—that is, near their highest-ever valuations—at the end of 2021.[2] Panel B tells an even cleaner story. A 60/40 portfolio promised (and actually delivered) 4%–5% real returns through much of the 20th century, but the last 40 years are different, showing a clear downtrend. In the early 1980s, we were in a world where asset valuations where low and real yields abundant: a high expected return world. Then we traveled over four decades to the opposite environment, culminating in 2021 in high valuations and low starting yields: a low expected return world. During this time, the simple expected real return of the 60/40 portfolio fell from above 6% to a trough of 1.3% at the end of 2021.

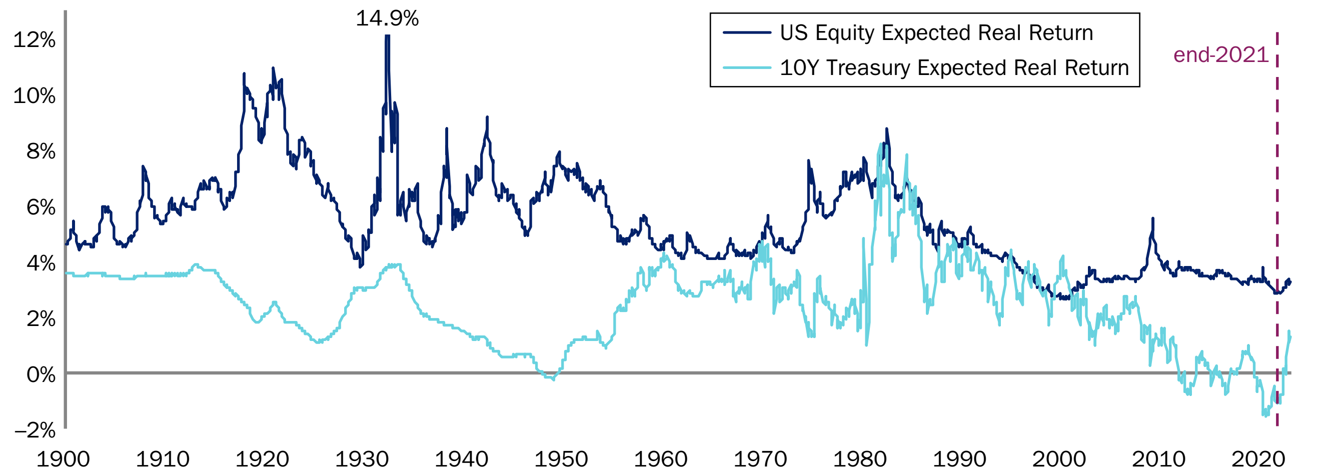
[1] In the Conclusions of Ilmanen (2022), I noted that despite having leaned toward slow pain for long, in 2021, I leaned toward the fast-pain scenario. We had not just the high valuations and other signs of speculative excess but also a plausible catalyst for repricing with the rising inflation and likely central bank response. This turned out to be an extremely lucky market timing call. I have become quite humble about market timing over the years, for a good reason: Neither I nor anyone else has consistent success in it. I'll later come back to the point that I had been calling expected returns low for almost a decade while realized asset returns remained strong.

[2] This is just one way to estimate expected asset returns, but many other designs tell a broadly similar story. And while the exhibit focuses on only two assets, its message applies pretty well to other countries and other asset classes. Most asset classes had starting yields near all-time lows in 2021 after a 40-year decline.

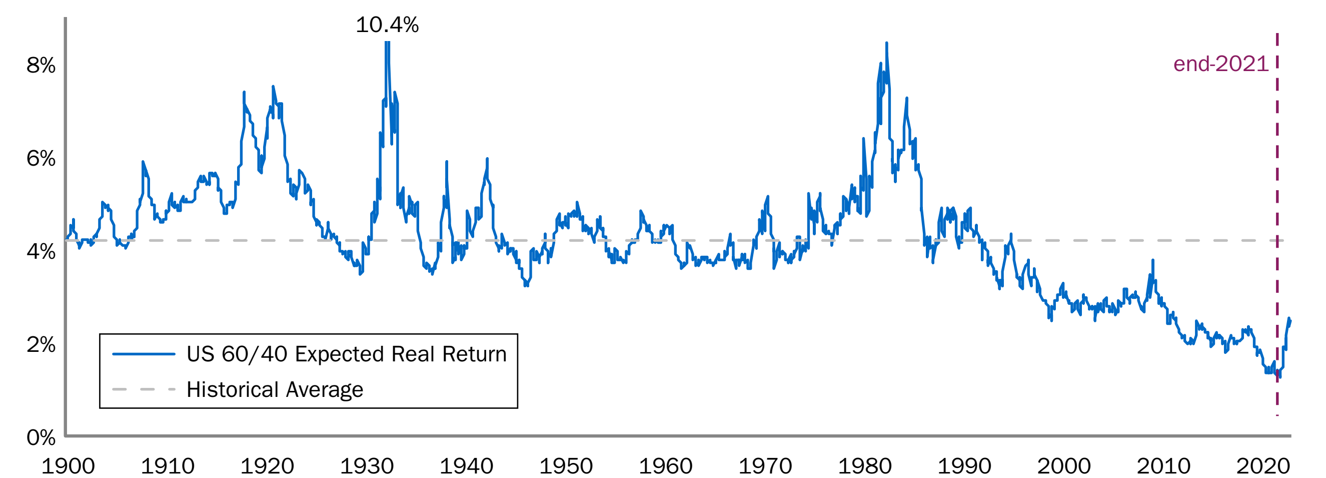
EXHIBIT 1

Simple Expected Real Return of US Equities and Bonds, January 1900–December 2022

Panel A: Expected Real Returns for S&P 500 Index (equities) and 10-year US Treasuries (bonds)



Panel B: Expected Real Returns for a 60/40 Stock/Bond Portfolio



NOTES: Equity is represented by the S&P 500 stocks (before 1926 using Cowles data as in Robert Shiller website). The equity real yield is the sum of income and growth proxies. Income is an average of two measures: D/P ratio and half of the cyclically-adjusted E/P ratio (which uses smoother 10-year real earnings in the numerator, and implicitly assumes 50% payout ratio), while growth is assumed to be 1.5% (long-run real compound EPS growth). No mean reversion is assumed. The real bond yield is the 10-year Treasury yield minus survey-based or statistical inflation forecast for a decade. The 60/40 real yield is a 60:40 blend of stocks' and bonds' expected real returns. A vertical dashed line highlights the end of 2021.

SOURCES: AQR, Robert Shiller's website, Kozicki and Tinsley (2006), Federal Reserve Bank of Philadelphia, Blue Chip Economic Indicators, Consensus Economics.

This multi-decade journey of richening valuations gave asset holders major windfall gains.[3] We effectively borrowed returns from the future because, without this richening, we would have lower realized asset returns in the rearview mirror and higher prospective returns now.

[3]These windfall gains, or the discount rate effect, refer to the positive impact of falling required returns on asset prices, valuations, and realized returns. This is most obvious for bonds where the inverse relationship between yields and prices is well known, but the same pattern applies to other assets such as stocks and houses.

When investors assess expected returns on bonds, they naturally use yields as forward-looking estimates and recognize that past decades' average returns were boosted by windfall gains. Yet, when many of the same investors assess expected returns on stocks or private assets, they too easily turn to the rearview-mirror perspective, ignore the lower starting yields, and forget how much the past average returns were boosted by asset repricing. As a case in point, the S&P 500 Index earned exceptional 14% realized annual real returns in the decade preceding 2022, but we can attribute almost half of this (6.6%) to the one-off richening effect, as the cyclically adjusted price–earnings ratio ("the Shiller CAPE") doubled from 20 to 40. The inverse of the Shiller CAPE is a simple proxy for the market's expected real long-run return, which thus halved from 5% to 2.5% thanks to multiple expansion.

It was easy for even seasoned investors to become complacent and ignore any warnings of low expected returns when realized returns were so flush in the 2010s and after the brief Covid bear market. Meanwhile, "the Fed Put," "Buy the Dip," and "FOMO" (fear of missing out) became buzzwords for younger investors, if they even bothered with traditional assets.

The richening of the S&P 500 was among the more extreme cases, but almost all asset markets—bonds, stocks, real estate, private equity—saw their valuations rise and real yields approach or dip below record-low levels by 2021. A key reason was the decline in Treasury and other government bond yields; as Exhibit 1 shows, the real 10-year bond yield finished its multi-decade fall near –1% in 2021, and many non-US markets were even lower.

It is helpful to recall that all these long assets are priced by discounting their expected future cash flows with a common riskless discount rate and some asset-specific premia. When that common part of the discount rate is at all-time lows, everything can be expensive at the same time. Those negative real Treasury yields were also used as one key justification for the high 2021 valuations of equities and real estate. It was almost comical how quickly bullish investors forgot this linkage after the TIPS (real Treasury) yield flipped from –1% to +1.5% (more on this later).

INVESTOR RESPONSES TO THE LOW EXPECTED RETURN CHALLENGE: REACH FOR RETURN, ESPECIALLY THROUGH PRIVATE ASSETS

Although many investors may have ignored the low expected return challenge amid the strong realized returns of the 2010s, others—especially larger asset owners—recognized it. A few adjusted their expected returns lower, but the more common approach was to try to achieve existing return objectives, even if markets were now offering less. Such investors chose to reach for yield and return,[4] and the only question was how to best do it. Some increased equity allocations or equity-like liquid allocations (high-yield bonds, equity-oriented hedge funds), others preferred illiquid private assets (private equity and credit, real estate, etc.), and yet others chose liquid alternatives (alternative risk premia, style premia, long–short factor investing—or their long-only counterpart, "smart beta").[5]

[4] This reach-for-yield response to lower yields has happened time and again in history, the 2010s is just the latest example. My book refers to precedents from Holland in the 1750s and England in the 1850s, but the best reference is in Chancellor (2002) when he quotes Walter Bagehot (the *Economist's* first editor in the mid-1800s): "John Bull can stand many things, but he cannot stand two percent."

[5] Many retail investors have been even more daring in reaching for return, especially after the post-Covid stimulus checks, favoring highly speculative assets from meme stocks and single-stock options to various cryptocurrencies.

In the mid-2010s, all three options were considered and applied by investors. More recently, however, illiquid private assets seemed to be getting all the inflows. I can see the benefits of illiquid assets, but it seems that investors take positive illiquidity premia too much for granted. Investors often think that they *should* get compensated for locking their money for 5–10 years—which is true if that were the only thing that drives private asset pricing. However, any fair illiquidity premium may be offset by investor demand for avoiding mark-to-market pricing (the "smoothing service" or "volatility laundering," Cliff Asness's more pointed term). It is possible that this feature has removed any net illiquidity premium or even could make it negative.[6]

My book argues that the long-run empirical support for illiquidity premia is much slimmer than it is for major style premia. Specifically, empirical analysis confirms that both the valuation gap between private and public equity and the realized outperformance narrowed dramatically in the mid-2000s, which coincided with David Swensen's books and example popularizing the "Endowment/Yale Model." The resulting inflows from other institutional investors into private equities presumably made their pricing more competitive and made it harder for private equity managers to beat their large (5%–6% all-in) fees. These managers gave one more leg up to their performance by collectively switching from small-cap value tilts to small-cap growth tilts in the 2010s; this turned out to be very helpful until 2021, but the reverse may be true in 2022 and, I suspect, the coming years.

Clearly, even though I see a useful long-run role for private assets in most portfolios, I believe that many investors' rose-tinted expectations for these assets will be disappointed. I am even more confident in this view in late 2022 because we have not seen private asset valuations respond to the significant rise in the real riskless yield. This reminds me of the classic cartoon where Wile E. Coyote runs over the cliff and keeps running, still waiting for the pull of gravity.

WHAT CHANGED IN 2022? KEY MACRO DEVELOPMENTS AND A REVISED OUTLOOK ON EXPECTED ASSET RETURNS[7]

Classic 60/40 portfolios with or without private asset extensions had a great decade—or even decades—before 2022, and then it was payback time. Falling nominal and real bond yields had given a benign backdrop to most asset classes, and corporate profit margins were elevated. After the 2008 Global Financial Crisis, central banks supported financial markets through both near-zero interest rates and quantitative easing. In 2020, the economic impact of the Covid-19 shock and the lockdowns was offset by both monetary policy and aggressive fiscal stimulus. The 60/40

To be fair, not *all* investors chose to raise risk; in reality, this would not be feasible. One prominent group that went the other way was corporate defined-benefit pension plans. Many of them chose to de-risk through liability-driven investing and eventually left the defined-benefit pension arena, leaving their employees to take the investment risk (and longevity risk) through defined-contribution pension plans.

[6] I am not the biggest crusader against artificially smooth reported returns (or their publication lag which reinforces "accounting diversification"). I acknowledge that smoothing confers benefits, allowing larger equity allocations and enabling greater patience amid drawdowns (e.g., private equities fell only 25% during the Global Financial Crisis, compared with a 60% fall for their listed equity proxy, making ill-timed capitulations less likely). I just say that such benefits come with a cost—these attractive features may offset a fair illiquid premium. Asness (2019) even argues that this may result in a net illiquidity discount. Late-2022 valuations of private versus public assets seem in line with this interpretation.

[7] If readers find it odd that someone from a systematic investment firm opines subjectively on these matters, I can only say that my background in partly discretionary macro roles has left an imprint. In any case, nobody trades directly on my humble opinions, and any reader should take them with more than a grain of salt.

portfolio earned a Sharpe ratio well above 1 for a decade prior to 2022, far above its long-run value of 0.5. Such an abnormally strong performance in the rearview mirror makes it less surprising that the year 2022 saw double-digit losses for both stocks and bonds, and the worst performance for the 60/40 portfolio in almost a century.[8]

The key trigger to poor returns was heightened inflation and the central bank response, which was delayed but then forceful. The 2021 rise in the headline US CPI rate from below 2% to 7% turned out not to be temporary; it stayed above 8% for most of 2022, the worst outcome since the early 1980s. The Fed raised its target rate from zero to above 4%, while also turning from quantitative easing to quantitative tightening.

The strongest market response has been the rise in real bond yields. As noted, the 10-year TIPS yield rose from –1% to +1.5%. Exhibit 1 also shows (using a slightly different metric) that the real yield rise was bond-led, while the expected real return on equity rose much less. Even for bonds, the nominal yield rise is less impressive because the 10-year breakeven inflation rate has remained surprisingly stable (near 2¼% at the start and end of 2022). Credit spreads have widened but far less than in 2020. I'll come back to the (non)reaction of private asset valuations later.

At the turn of 2022–23, markets are fighting the Fed by pricing in faster disinflation and an early pivot in monetary policy, both against the Fed's projections. Apparently, this logic is motivated by prevalent recession fears (evident in many surveys and the inverted yield curve), but given the health in risky assets and earnings projections, the expectation seems to be for a painless disinflation and mild recession. Such a goldilocks outcome could happen but is optimistic. The still-strong job market and still-large cash balances (from the massive fiscal stimulus in 2020–21), together with the reopening of China, support only a mild slowdown—but this outcome would make it less likely that wage growth falls fast from 5% and helps inflation back to 2%–3% in 2023.

To me this all looks like wishful thinking from a generation of investors who have not seen a serious inflation or the kind of sustained Fed tightening that is needed to defeat it. These investors don't see that this is no longer the "Fed Put" world where the central bank comes to help when asset markets are hurting but the "Fed Call" world where the central bank has to cool down financial conditions either with the help of less-exuberant asset markets or through more aggressive rate hikes. The more complacent markets are, the more work the Fed has to do itself.

The counter-story is that the Fed has already done too much and will need to pivot when the economy and the inflation fall sharply in 2023. The Fed is criticized for creating an unnecessary recession by its excess vigilance, but it is trying to contain second-round effects (a euphemism for higher wage demands) and to prevent the un-anchoring of inflation expectations—as well as to protect its credibility. Many younger observers do not know that lost Fed credibility might bring back a 2%–3% inflation risk premium in bond yields, which was typical in the early/mid 1980s.[9] Likewise, those who call for 3%–4% inflation targets instead of 2% do not see that

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[8] The total return of –17.3% for the S&P500/Tsy10Y combo was the fifth-worst year since 1900 (a near-tie with 2008), after 1931 (–28%), 1937, 1907, and 1917. The excess-of-cash return of –19.2% was the sixth-worst year, after 1931 (–29%), 1907, 1937, 1974, and 1917. The real return of –22.7% was the fourth-worst year, after 1917 (–31%), 1974, and 1937 (but well ahead of 1931 and 2008).

[9] The inflation risk premium in bond yields—excess return investors require beyond rate expectations—dropped to near zero in the 2000s once long-run inflation expectations became low and stable, but the rising inflation uncertainty may yet bring it back up. As discussed in another article in this issue (Brixton et al. 2023), higher inflation uncertainty may also shift the stock–bond correlation from negative to positive and thereby make government bonds less helpful safe-haven assets for broad portfolios, which in turn could further raise the term premia investors require.

bond yields would rise more than the higher inflation expectations because investors would begin to again demand a positive inflation risk premium.

Looking further out, I am not sure that the Fed can keep inflation near its 2% target when higher inflation will be seen as a lubricant that helps solve problems related to high debt levels and spending needs on climate change, reshoring, and so on. If they do succeed, the prize is that bond yields may not embed a positive inflation risk premium.

I can offer several silver linings to my bleak market outlook:

- Real yields seem unlikely to rise back to historically average levels, and this should contain the bear market on all assets. In my reading, the most important forces that have brought real rates low, even negative, are the twin saving gluts from pension savers and the very rich. As long as these twin forces are in play, excess savings should keep a lid on how high real rates will rise, thereby supporting the valuations of other assets.[10]
- Bear markets are good news for young savers: Cheaper assets are more affordable assets. Exhibit 1 shows that the 60/40 portfolio offers an expected real return at the end of 2022 (of 2.6%) that is twice as high as at the end of 2021.
- Further, if there may still be a mix of fast and slow pain ahead, I remind readers that happiness is the difference between reality and expectations. Then, by lowering readers' long-run expectations I effectively boost their long-run happiness.
- The best silver lining of all is that I may be wrong, not just near term but on the low long-run returns. The main logic how future asset returns could surprise on the upside is probably related to even greater technological advances that boost economic growth.

After this lengthy rumination, I more succinctly summarize my end-2022 thinking on major asset classes (which may be outdated or proven wrong by the time you read this):[11]

- The sharp rise in riskless yields has challenged the valuations of most asset classes and multi-asset portfolios, whether 60/40, risk parity, or endowment-like portfolios with large illiquid allocations.
- Equities are cheaper but no more TINA ("there is no alternative") and may still be vulnerable to the past discount rate repricing and/or prospective earnings decline. From a valuation perspective, US equities seem the most vulnerable, and the US-vs.-rest-of-the-world trade may be the last contrarian shoe to drop.
- Bond yields have become clearly more attractive, though mainly from the real yield side. At least corporate defined benefit plans that had glide paths guiding them to wait before shifting to LDI mode have the first opportunity in 15 years to do so from a fully funded position. On the negative side, the

[10] The relative role of the two saving glut explanations is evaluated in Mian, Straub, and Sufi (2021). To counter my optimistic view on lowish prospective real rates, one can argue that both sources of savings glut can revert—due to redistribution pressures and baby boomer dissaving—or that their impact on real yields may be offset by high investments on environment, reshoring, defense, new health challenges, etc. Beyond r* (the natural rate of real interest at which inflation and job markets are stable), which gives the expected average short-term real riskless rate for all investments, there are also term, credit, and other premia that influence required real asset yields.

[11] These comments have a shorter horizon than formal AQR capital market assumptions, which look 5–10 years ahead and rely on systematic rules rather than discretionary opining; see AQR Alternative Thinking (2023).

Fed is still tightening; the required term premium could rise with inflation uncertainty; and one day markets might begin to care about the high fiscal deficits, debts, and contingent liabilities.

- Corporate bonds have cheapened more than either equities or private credit, but the spreads could easily widen more in a risk-off scenario. Their relative value is more compelling than their absolute value.
- Commodities are the only asset class with a reliably positive correlation with inflation news. Some expect a commodities supercycle in the 2020s, and even without it, empirical evidence suggests that there is a better long-run reward than is commonly thought.[12] Still, it is not an easy asset class to stick with.
- Private assets have not yet noticed that the everything-is-expensive world ended in 2022. Whatever humble opining I do here on inflation and Fed prospects, my simplest view is the strongest: Private equity, real estate and other illiquid asset valuations have not yet responded (fallen) nearly enough given what has already happened to the riskless part of their discount rate. There's a separate question whether rising inflation should hurt these assets,[13] but it should be clear that a 2% rise in the riskless real discount rate influences the valuations of these real assets. Smoothing can only delay the inevitable in protracted bear markets, so private asset managers must really hope that the 2022 market moves revert conveniently before private assets need to be repriced.
- In sum, after a TIPS yield-led repricing, now it is not a world where the common, record-low discount rate keeps everything expensive, but a world of compressed risk premia.

RELATIVE WINDS CHANGE FOR LONG–SHORT STRATEGIES

As highlighted previously, all long-only assets can be priced by discounting them with a common riskless rate and some asset-specific premia. Negative real yields helped all major asset classes reach low starting yields at the same time, so the income return (carry) was low, pointing to slow pain. Alternatively, a rise in TIPS yields should cause capital losses to all these "long duration" assets, leading to fast pain. The latter scenario materialized in 2022.

These same challenges need not apply to long–short strategies, because the yield level or duration effects wash out between the long and short legs, resulting in roughly net zero duration. This partly explains why long–short strategies such as hedge funds or style premia did not share the falling-yields and bull-market tailwinds with long-only assets in the 2010s, and why they did not share the rising-yields and bear-market headwinds in 2022.[14] No winds are better than headwinds, and some styles even managed to shine in 2022.

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[12] See Levine et al. (2018) and my book, chapter 4.5 (Ilmanen 2022).

[13] It is an open question whether they are any better inflation hedges than listed equities, which empirically tend to suffer amid rising inflation, despite in theory being real assets. Empirical evidence is not too promising, and the answer surely varies within asset classes (e.g., "short-duration real estate" with frequent rent repricing should be more immune to rising rates than its long-duration cousin, and energy-related assets have been better inflation hedges than other sectors).

[14] These statements are simplifications because hedge funds and some style premia have clearly positive net beta or net duration and because even market-neutral strategies may suffer in deleveraging scenarios or Fed tightening episodes.

I will discuss value and trend styles in the next sections as diversifiers that performed well when most needed (when the core portfolio suffered).[15] As an evidence-based investor, I am more impressed by the two-centuries-long track records of these styles in many different asset classes than by their 2022 performance. But as an evidence-based investor, I also know that both strategies can suffer from a multi-year bad patch—and that it is very difficult for most investors to stick with them through the bad times, notwithstanding any paper histories. Both strategies, and style investing in general, grew in popularity in the 2010s before a phase of disappointing performance that led to large investor capitulations.

I still believe that bold risk diversification is the most reliable way to improve a portfolio's risk-adjusted returns—and long-run total returns if leverage is allowed to get portfolio risk to, say, 10% volatility. According to the fundamental law of active management, we can double a portfolio's long-run Sharpe ratio with four uncorrelated strategies. Diversification across long–short style premia within one asset class can realistically enable such doubling, while multi-asset strategies may enable further doubling. The downsides of such long–short strategies are their unconventionality and the need for meaningful shorting and leverage to make them really matter, as well as being short on stories (lack of easy narratives to explain positions or performance).

In the 2010s, I often argued that investors can improve their strategic portfolios by more aggressive risk diversification, not letting the market-directional equity risk dominate. I have become humbler about this message, given the 2010s experience. If equity-risk-dominated portfolios improve investor stickiness, they may result in better real-world outcomes than strategies that would outperform on paper. A strategy is good only if you can stick with it. Here, equity market risk has an advantage: Only equities are forgiven a down-decade—and even the successful United States had three of them in the past century.

The broader issue here is *investor impatience*, one of the key themes in my book. Simply put, investors demand more performance consistency than is feasible in competitive financial markets. And when they don't get what they want, they deallocate from their laggards and chase multi-year winners (which, given some empirical evidence of multi-year mean reversion patterns, is opposite to good investing).

I have changed the tune of my preaching because I recognize it is especially hard for most investors to stay patient with unconventional diversifiers.[16] I still hope investors can challenge themselves, but they should also be realistic when looking in the mirror. For investors who cannot be sticky, equity-risk-dominated portfolios may be the better approach, despite risk concentration. Anyway, this is what most investors have chosen in reality. Then, it becomes especially important to ask which risk-mitigating strategies help when that main risk of large equity market drawdown materializes. Of the candidates, I believe trend following is hard to beat, as discussed later.

UNDERSTANDING THE ROLLERCOASTER RIDE OF THE VALUE-VS.-GROWTH STRATEGY

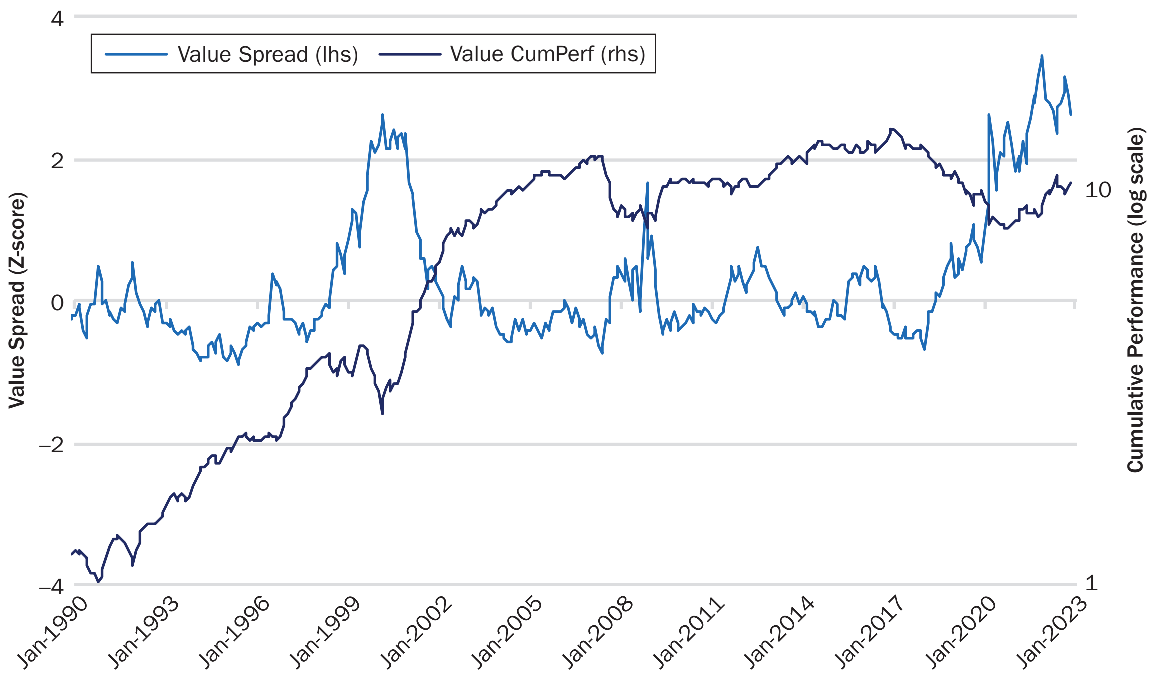
Investors often want a single story for why a strategy performed well or did poorly. Long–short styles are too heterogeneous for there to be just one story. Let me focus on the value-versus-growth stock selection strategy. Note that this is one

[15] These were hardly the only examples, although they were the most prominent among style premia. Many forms of diversification disappointed in the decade prior to 2022 (especially when compared with the US 60/40 portfolio) and worked much better during it. Commodities are another example, and some hedge funds succeeded.

[16] For those who can, bold diversification remains the most reliable way to accumulate long-run wealth. But it is not easy: The late 2010s is a case in point, when useful diversifiers like commodities or value and trend styles suffered, resulting in large investor outflows.

EXHIBIT 2

Value Spread and Value Strategy Performance, January 1990–November 2022



NOTES: The series track the forward-looking attractiveness (value spread) and the cumulative realized return of a long–short value portfolio constructed on an industry- and dollar-neutral basis. The universe includes about 1,000 large- and mid-cap US stocks, which are sorted within each industry by an average of five value metrics (book/price ratio, earnings/price ratio, forward earnings/price ratio, sales/enterprise value ratio, and cash flow/enterprise value ratio).

SOURCES: AQR, IBES, and Xpressfeed.

type of contrarian strategy, distinct from market timing or country allocation. Even for systematic value-oriented stock selection there are numerous design decisions that differentiate these strategies. Exhibit 2 shows the cumulative realized return of one value-vs.-growth long–short strategy (thin line, right axis) and a measure of its forward-looking attractiveness, the value spread, which tracks how cheap value stocks are compared with growth stocks (thick line, left axis). This specification studies each month about 1,000 largest US stocks and creates a dollar-neutral long–short portfolio between the cheapest and richest stocks within each industry based on five value metrics (book, sales, cash flow, earnings, and forward earnings).[17] The value spread evaluates the same portfolio's attractiveness using the five corresponding value spreads and summarizing the information in a Z-score (where a large positive score signals exceptional cheapness of value vs. growth).

The value strategy had a good 20-year track record before the 2010s (and combining other data sources, it even had a good two centuries), however, with meaningful drawdowns in the late 1990s and the late 2000s. The fall between 2018 and 2020 turned out to be longer and deeper than its predecessors. Despite a nice recovery since then, scars are still felt, and sadly, many investors capitulated during the

[17] The industry-neutral specification is the most important differentiator to the typical Fama–French value strategy, which ranks all stocks in the US universe, effectively comparing a tech stock with an energy stock and with a bank. By creating industry-neutral value portfolios, we achieve better comparability, better diversification, and better long-run returns. For example, the industry-neutral strategy earned positive returns between 2010 and 2017 while the raw value strategy lost money (although both variants lost bundles in 2018–20).

deep drawdown. The good news is that the big losses brought the forward-looking opportunity to its most attractive levels in history, as the value spread became even wider than during the late-1990s dot-com bubble. Pleasingly for value investors, many measures of the value spread have remained near record levels through 2022, despite strong realized returns.[18]

What caused the exceptional value strategy drawdown? Many conjectures have been offered and evaluated.[19] I will briefly cover three popular candidates that do not seem to fit the data and then discuss the one that fits best:

- omitted intangibles,
- crowding,
- low yields,
- a bubble.

Many researchers argue that old-economy valuation metrics like book/price ratio are obsolete, as intangible investments have become larger than tangible ones. This argument is valid but its empirical impact has been overstated. Strategies using other valuation metrics that indirectly or directly include intangibles have performed somewhat better, but they, too, lost a bundle in 2018–20.

The argument that overcrowding caused the drawdown in value strategies has some problems. Value had already disappointed in the decade before 2018–20, so it was hardly excessively popular, and value spreads did not suggest it was particularly expensive. The crowding story would be more plausible if disappointing factor performance had been led by defensive/quality stocks (which had fared well and looked rich in the mid/late 2010s), but these stocks kept performing reasonably well.

Then there is the story that low yields hurt the value-vs.-growth strategy because growth stocks have a longer duration (their expected cash flows are further in the future). This appealing logic has some holes (e.g., expected cash flows are uncertain and hard to predict beyond a few years), and in the long run, the empirical correlation between the value strategy returns and bond yield changes has been near zero.[20] However, this correlation kept increasing through the 2010s, and by 2019–21, the fact that markets believed in this story may have made it a self-fulfilling prophecy.

If we want one explanation for value stocks' underperformance versus growth stocks in the late 2010s (or the late 1990s), the most convincing is that the strategy was on the wrong side of a bubble. Bubbles often start with rational roots. In this case, growth stocks initially had improving fundamentals, and they benefited from low yields in the 2010s. As so-called FANMAG stocks outperformed,[21] investors became increasingly interested in FANMAG "wannabes"—disruptive stocks within every industry, typically unprofitable growth stocks—that were expected to be the winners in the shift from a physical economy to a digital economy. As often happens, markets then took things too far and pushed growth stocks' valuations to unsustainable levels.

One way to interpret the growth-vs.-value performance in the past decade is through a stylized equation: "over-extrapolation + overconfidence = bubble." The normal overpricing of growth stocks and underpricing of value stocks reflects overextrapolation of their past growth. There is some empirical persistence in growth but markets discount even more, and this is the root cause for the long-run outperformance of value.

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[18] Logically, value spreads can remain record level amid double-digit value strategy returns only if the fundamentals are favoring value stocks over growth stocks or if the strategy keeps rotating to new value and growth stocks. Both of these features contributed to value strategy gains in 2022.

[19] See, for example, Israel, Laursen, and Richardson (2021) and Arnott et al. (2021).

[20] See Maloney and Moskowitz (2021).

[21] The FANMAG stocks are Facebook, Apple, Netflix, Microsoft, Amazon, and Google.

The real danger arises when the overextrapolators are successful for a few years, as happened by the late 2010s.[22] Success breeds overconfidence, in this case an unrealistic belief that disruptive companies' excess growth could be predicted 10–20 years out (while normally markets or analysts have little ability to predict firm-specific abnormal growth beyond a few years). This led to a bubble in 2019–20, with rising valuations of growth stocks unsupported by fundamentals, reinforced by Covid lockdowns.[23]

Investor flows may also have contributed to the bubble. Through the 2010s, growth stocks benefited from flows among actively managed public equity portfolios (as investors chased past returns) and among private equity portfolios (as private equity managers began to favor small-cap growth instead of value), and maybe even from the rising share of passive investing (as their outperformance made them a larger part of the popular S&P 500 Index).

This bubble was followed by a bust in 2021–22, which according to forward-looking valuations is hardly over yet. Fundamentals matter again, and there's something healthy about this—and, self-servingly, it tends to provide a better backdrop for systematic strategies than the la-la-land where we arguably lived for a while. To be clear, one can only be sure with hindsight whether rising asset prices are a reversible bubble rather than a structural change, and timing a bubble is notoriously difficult. Contrarian investors tend to be early, and early equals wrong.[24] Or, as Keynes *may have* said, "markets can remain irrational longer than you can stay solvent." Many investors lost their faith along the way. Fortunately, value spreads suggest it is not too late to earn some payback.

RISK-MITIGATORS FOR EQUITY DRAWDOWNS: TREND IS YOUR FRIEND

Before I turned to value investing, I noted that investors should pay special attention to risk-mitigating strategies that help when their portfolio's key risk materializes. For most investors, this key risk is a deep equity market drawdown. I therefore listed in my book the worst drawdowns for the S&P 500 over the past century, together with the performance of five popular risk-mitigating strategies: tail hedging through index put buying, trend following, Treasuries, gold, and defensive stocks (quality-minus-junk long–short stock selection strategy). I add in Exhibit 3 a row for the 2022 drawdown (although it is too early to tell whether this drawdown will become even deeper in 2023).[25]

[22] Larry Summers highlighted this logic in direct communication. Frankel and Froot (1990) made a similar point about chartists' growing role over fundamentalists in currency markets when explaining the ever-rising dollar in the early 1980s.

[23] Asness (2022a) points out that the wide value spreads and the heightened correlation between value strategy performance and falling bond yields may have been different manifestations of the same bubble (which is now deflating). Both followed from growth-bulls' confidence in their ability to predict future cash flows further out than has ever been done (which, if true, could justify both the wide value spreads and the extra-long empirical duration attributed to the growth stocks).

[24] Combining this wisdom with the fact that the 2010s saw an exceptionally long economic expansion and a bull market (roughly double the typical length of 4–6 years), it is not surprising ex-post that so many contrarian strategies failed in the late 2010s (not just in market timing but in country allocation and stock selection—all of which had some common roots in FANMAG stocks). Even relatively patient contrarians would've been early.

[25] I also revise here the trend-following series as I accidentally used in the book a particularly conservative version of trend, only using a 12-month window and including a one-month execution lag. Here, I use an average of 1-, 3-, and 12-month windows, and instead of the execution lag, I subtract estimated trading costs as in Hurst, Ooi, and Pedersen (2017). Both specifications have tended to perform well during equity market drawdowns, especially the more protracted ones, but the variant shown here fared even better.

EXHIBIT 3

Performance of Five Risk-Mitigating Strategies in the Worst Drawdowns of US Equities for over a Century

Peak	Trough	Length P-T	Depth P-T	Put Buying	Trend	Treasury	Gold	QMJ US SS
Mar-1920	Aug-1921	17	–26%		19%	–4%		
Aug-1929	Jun-1932	34	–84%		50%	–1%		
Jan-1937	Mar-1938	13	–50%		–5%	6%		
May-1946	Nov-1946	6	–22%		6%	–1%		
Jul-1956	Dec-1957	17	–18%		15%	–1%		1%
Nov-1961	Jun-1962	7	–23%		11%	0%		0%
Jan-1966	Sep-1966	8	–18%		10%	–2%		2%
Nov-1968	Jun-1970	19	–37%		57%	–13%		34%
Dec-1972	Sep-1974	21	–50%		102%	–11%	129%	5%
Nov-1980	Jul-1982	20	–35%		26%	–6%	–59%	13%
Jun-1983	Jul-1984	12	–15%		6%	–6%	–28%	17%
Aug-1987	Nov-1987	3	–31%	23%	–4%	0%	7%	4%
Aug-1989	Oct-1990	14	–18%	–6%	24%	–1%	–4%	29%
Apr-1998	Aug-1998	4	–15%	11%	14%	4%	–12%	12%
Mar-2000	Sep-2002	30	–49%	11%	39%	23%	5%	96%
Oct-2007	Feb-2009	16	–52%	31%	29%	14%	14%	53%
Apr-2011	Sep-2011	5	–16%	9%	8%	10%	4%	20%
Dec-2019	Mar-2020	3	–20%	27%	5%	10%	4%	1%
Dec-2021	**Sep-2022**	**9**	**–24%**	**3%**	**13%**	**–14%**	**–10%**	**10%**

NOTES: All returns, including the S&P 500 Index used to measure equity market drawdowns, are in excess of cash (US 3-month LIBOR) or using self-financed futures/forwards. All returns bar Trend are before trading costs. The list of drawdown episodes for the S&P 500 includes a few cases where the equity market excess return had not yet quite reached the past peak but had recovered most of the way before losing half of their value (1937–8, 1972–74, 2007–9 bear markets are such famous second legs). The Put Buying strategy is a backtest that involves buying a 5% out-of-the-money one-month put on the S&P 500 (pre-1996 on the S&P 100) at mid-month and rebalancing into a new put at expiry (using the CBOE Protective Put index in excess of the S&P 500 for 2022). Put returns are expressed as a percentage of the underlying index NAV, gross of trading costs and fees. For comparability, the series is scaled to 10% volatility based on the 6% volatility of the unlevered return over the full sample, implying a leverage of 1.67. The Trend return is a back-test, gross of fees but net of estimated transaction costs, as in Hurst, Ooi, and Pedersen (2017). The strategy applies trend following at 1-, 3- and 12-month windows in four asset classes and targets overall portfolio volatility of 10%. Treasury is the excess return of 10-year Treasuries over T-bills, sourced from Global Financial Data, Bloomberg, and Datastream. Gold is the gold futures return (excluding cash) from Bloomberg. QMJ US SS, or the quality-minus-junk factor for US stock selection, is a broad composite long–short portfolio based on 16 quality metrics within profitability, growth, and safety subgroups. The factor was developed by Asness, Frazzini, and Pedersen (2019) and is regularly updated at aqr.com.)

SOURCE: AQR, Bloomberg, CBOE, Commodity Systems Inc., Datastream, Global Financial Data, and Option Metrics.

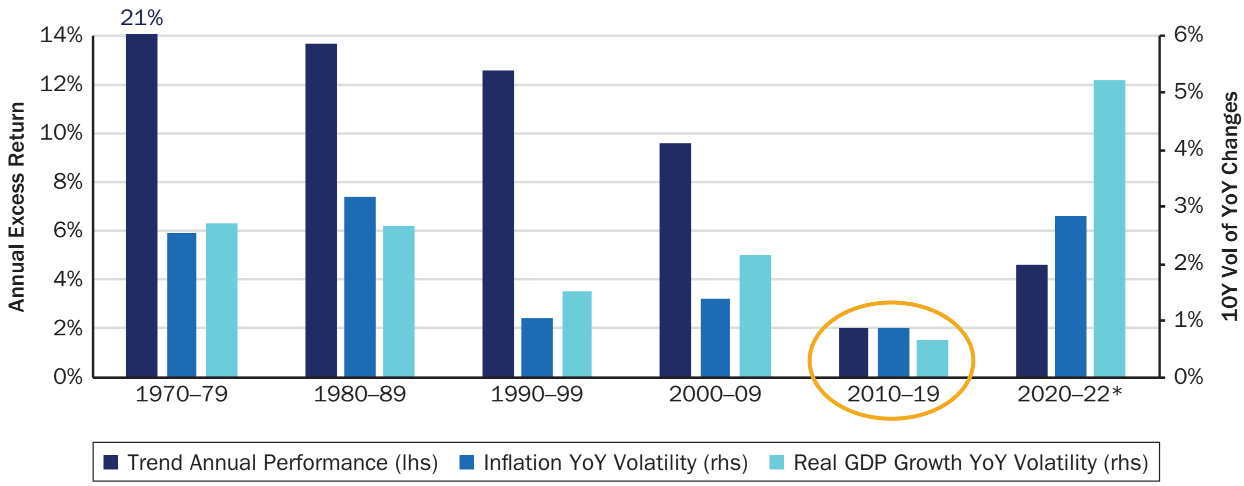
All five strategies have tended to help in equity market drawdowns.[26] Most public debates have been between put-buying strategies (as proxies for simple option-based tail hedging) and trend-following strategies (as proxies for indirect tail hedging). The former are best suited to fast crashes like March 2020 but may disappoint in protracted bear markets like 2022. The latter are best suited to slow and protracted drawdowns but could disappoint in fast crashes. Another key difference is the sign of long-run returns.[27] In 2022, trend was the best performer, while Treasuries and gold disappointed.

[26] Only the quality-minus-junk strategy never lost money, but this outcome is partly mechanical because quality stocks have lower betas than junky stocks, and a negative net beta is a great ally in major bear markets.

[27] See Ilmanen et al. (2021) and AQR Alternative Thinking (2022). Also note that because the put strategy has a consistently negative long-run return and trend following a positive one (not shown), it seems clear that investors demand a larger risk or insurance premium for fast crashes than for gradual bear markets. It is more plausible that investors can stick with (higher-earning) trend than put strategies through their dry patches, though neither is easy.

EXHIBIT 4

US Macro Volatility and Trend Performance per Decade, January 1970–June 2022



NOTES: Trend strategy is described in Exhibit 3. Macro volatilities are based on YoY change in CPI and RGDP, respectively.
* Last observation covers only 2.5 years.

SOURCES: AQR, Federal Reserve, Bloomberg.

Further analysis of trend following—and its cousin, macro investing[28]—makes it look like a particularly good complement to common investor portfolios that are dominated by equity risk. Not only have these strategies offered a positive long-run return and good performance amid equity market drawdowns, but they also have tended to perform well at other times of trouble for the core portfolio: Fed tightening, high volatility, and large moves in inflation up or down. Moreover, trend following is a great fit alongside private equity and other illiquid assets because illiquids need not worry about fast crashes (smoothing takes care of those), so their Achilles' heel is precisely the protracted bear market where trend is an especially reliable risk mitigator. This factoid is increasingly relevant given many investors' growing allocations to such illiquid assets. We call trend and private equity "a match made in heaven," while acknowledging that they are odd bedfellows.

Despite these strategic advantages, many investors found it hard to stick with their trend (and macro) allocations when these went through a dry patch in the late 2010s. Not as steep a drawdown as the value strategy experienced but enough to result in deallocations.[29] With hindsight, the muted performance of trend after large gains during the 2008 Global Financial Crisis can be traced back to central banks' success in suppressing macro volatility in the 2010s (see Exhibit 4). With the macro volatility genie out of the bottle, 2022 was a great year for trend and macro strategies. If central bankers struggle to again suppress macro volatility, and the challenging environment for investors' core portfolios persists, these strategies may continue to be particularly helpful.

Circling back to the Chinese curse, trend is your friend, and more so in interesting times.

[28] Global macro investors are typically discretionary, but a systematic proxy for many great managers is economic trend (or macro momentum, if cross-country strategies are included). This strategy takes positions based on last year's macroeconomic news instead of last year's asset returns. It is a good complement to returns-based trend following and has comparable long-run performance and risk-mitigating characteristics (see Brooks, Ooi, and Akant 2023).

[29] Many trend managers drew the lesson that they must "hedge themselves to retain assets" and combine trend with carry and other positive-beta strategies that help them perform better in bull markets. However, such additions offset the risk-mitigating characteristics of trend. Asset owners need to decide how much they value the trend strategy for its standalone performance and how much for its complementary risk-mitigating services to their core portfolio (Asness 2022b).

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