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# Why Are Bond Investors Contrarian While Equity Investors Extrapolate?

Understanding Return Expectations, Part 3<sup>1</sup>

## Executive Summary

Survey data reveal a striking difference in how investors form long-run expectations in equity and bond markets. Equity investors tend to extrapolate recent trends in returns and earnings growth, while bond investors tend to expect mean reversion in rates. This article explores the contrast and possible explanations for it, proposing information *salience* as the key driver. It also examines very long run trends in financial market variables and potential implications for the future.

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# Introduction

One theme that goes through this series is the distinction between forward-looking expectations based on current market valuations or yields, and rearview-mirror expectations that are guided by the last 3-10 years' realized performance.<sup>2</sup> The former has a contrarian bent, the latter an extrapolative bent. So which approach is more common in practice? How do most investors form their long-run return expectations? If we've just experienced a very bullish decade, like stocks in 2000 or 2021, these two approaches point to opposite directions (see Exhibit 1 in [Part 1](#)).

Part 3 of this series makes (what I gather is) an original claim: Investors have very different expectations formation patterns when they invest in bonds or rates than when they invest in stocks.<sup>3</sup> (Later papers will drill deeper into this claim.) Specifically, I argue that bond investors tend to expect reversals and stock investors continuations. After a long bull market in bonds which has brought yields to abnormally low levels, bond investors rarely get excited but rather recognize the low starting yields and the possibility of mean reversion. In contrast, after a long bull market in stocks which has brought valuations to abnormally high levels (and thus starting equity yields to low levels), exuberance and growth optimism are more common reactions

than fears of market valuations reverting down to past norms.

We'll show some visual evidence supporting this claim of contrasting expectations formation patterns in the two major asset classes. Moreover, we'll propose an explanation. While we discuss some other candidate explanations, we conclude that *salience* is the main reason. Here's the simplest story: Bond investors are used to thinking about market yields which are inherently forward-looking. The 10-year Treasury bond is not discussed in the media or among investors in terms of its price, say,  $101\frac{7}{32}$ , but in terms of its yield of 4.20%. In contrast, equity investors are more exposed to prices and recent realized returns, and past strength inspires expectations of more strength.

The core claim may seem intuitive and obvious to readers, yet try finding it in the academic literature. The contrasting expectation formation patterns for bonds and stocks is a new idea for academics, as far as I know (and I do follow the literature).<sup>4</sup> I hope to get profuse thanks from some inspired finance researchers for their published journal article in 2027 or at least from a Ph.D. student for a great dissertation topic.<sup>5</sup>

<sup>2</sup> See Ilmanen (2025) [here](#) and Ilmanen-Maloney (2025) [here](#).

<sup>3</sup> There is some segmentation in the clienteles -- bond investors are stereotypically more conservative and stock investors more speculative/aggressive -- but I think the claim works even if we consider the same investor investing in both asset classes.

<sup>4</sup> Actually, the extrapolative camp extends beyond stocks to private asset classes, commodities and hedge funds with no salient yield data. It really is rates versus the rest.

<sup>5</sup> It might also be that bond investors are more rational and quantitatively-oriented and equity investors more prone to animal spirits and stories-oriented, but this distinction too may trace back to salience. Long-horizon returns of a bond investment are logically and empirically well anchored to starting yields, while for equities a good growth story can always justify the continuation of a bull market. Maybe the key distinction is not bonds versus stocks but cash flows versus discount rates (see last section). We can tell more memorable stories on cash flow opportunities than on discount rates. So the future Ph.D. student could also explore whether all cash flow expectations are inherently extrapolative while all discount rate expectations are inherently contrarian.

# Visual Empirical Evidence

Let's start with bond markets. Connoisseurs know that many respectable term structure models embed an assumption of mean-reverting rate expectations. This practice has been hard to stick with through decades when mean reversion rarely happened. Bond investors and experts were criticized in the 1960s-70s for not anticipating or recognizing the decades-long uptrend toward ever-higher inflation rates and bond yields. And then they - or the next generation - were criticized for missing the 40-year downtrend between 1981 and 2021.

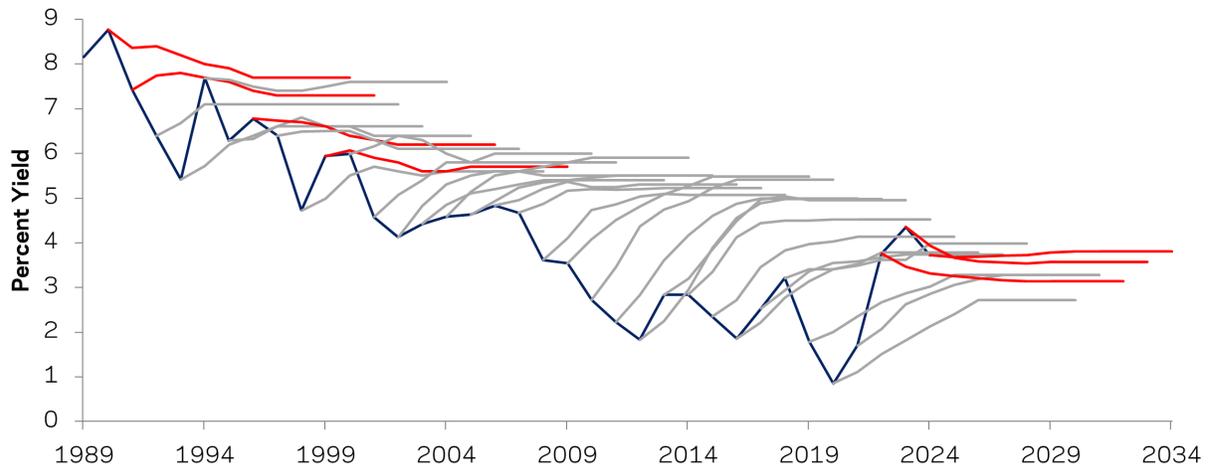
We'll have more to say about this in future articles, but let's say now that these extremely persistent up and down outcomes (which truly were surprising) made mean-reverting rate expectations look foolish. Many readers have seen "the folly of forecasting" highlighted with hair-charts like **Exhibit 1**. Through decades of falling rates, expert economists kept expecting rates to rise ("normalize"), but the rise never happened (well, until 2022). The story looks very similar whether we look at 10-year Treasury yields or 3-month bill rates.

The decades-long bull market in bonds provided bountiful gains as bonds provided both positive carry when the yield curve was mostly upward-sloping and capital gains when yields fell. The only way you could lose was if you chose to be bearish on bonds. And many did. Consensus expectations toward rising rates turned out to be wrong, wrong, wrong for a long time.

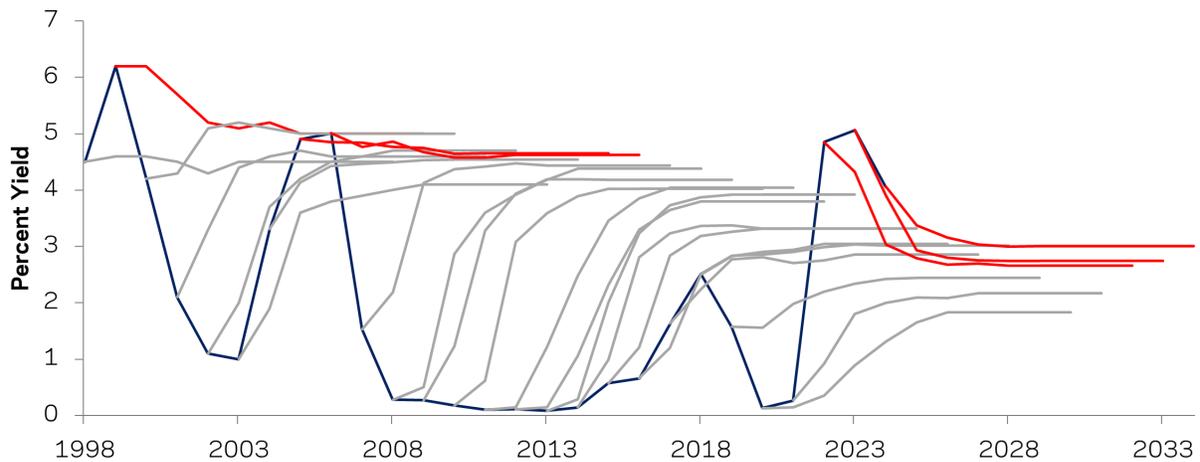
Instead of becoming a laughing stock, the expert forecasters would like you to know that "all-knowing" market predictions from forward rates were no smarter (we'll show this in a future writeup, I promise), and that at least they got some details right. The consensus forecast predicted most rate rises when rates were the lowest, and after some temporary rate rises economists predicted normalization to the downside. Predictions that pointed downwards are shown in red - you can see that these occurred after rate rises, and they tended to get the direction right.

## Exhibit 1. Mean-Reverting Rate Expectations in Bond Markets

### A. Consensus Forecasts of 10Y Treasury Bond Yields, October 1, 1989 - October 31, 2024



### B. Consensus Forecasts of 3M Treasury Bill Yields, October 1, 1998 - October 31, 2024



Sources: AQR, Consensus Economics. The exhibits show the spot yield in blue and forecasters' expectations of the yield curve 10 years out in gray for 10-Year Treasury Bonds and 3-Month Treasury Bills for each year across time. Expectations of an inverted yield curve are highlighted in red.

Yet the common takeaway from **Exhibit 1** is what economists got wrong, not right. During a long period from 1990 to 2020 rates trended lower while economists predicted rate rises, in vain. A typical viewer response to such charts was “When will they ever learn?”

A more sympathetic reading of **Exhibit 1** is that the economists displayed mean-reverting rate expectations toward a mean that was gradually shifting lower over time. They did not anticipate a secular downtrend—which reflected a truly unpredictable sequence of surprises when both inflation expectations and the neutral real rate kept edging lower. By

this reading, economists behaved rationally and consistently with the best information they had at the time, expecting a reversal toward the past-decade mean—but no significant reversal materialized until 2022.

Bottom line: Both the experts (the economist consensus forecast) and the market (the yield curve) exhibited mean-reverting rate expectations which made sense *ex ante* but looked irrational *ex post* after decades of repeated downward surprises on inflation and real rates.<sup>6</sup> For our purposes, trying to understand how investors form expectations, the key point is that bond investors have a clear contrarian mindset.

While expectations of mean reversion dominate bond market participants' headspace, equity market participants think differently. They learn from history, emulate it and extrapolate it, instead of bucking it.

One group of equity market participants where we can observe long-term (ok, not 10-year but 3- to 5-year) expectations is equity analysts. These are professionals who spend most of their time thinking about equities in their target companies. And they are incentivized to make good predictions (though we'll see this is not their only incentive).

**Exhibit 2** plots the aggregated consensus of equity analysts' long-run earnings growth forecasts across all US large-cap stocks (for a 3- to 5-year horizon) and compares it to past realized earnings growth.<sup>7</sup> Clearly, analysts have tended to be overoptimistic—their predictions have averaged more than twice the 6% realized nominal annual EPS growth rate. Such optimism may reflect the analysts' sunny nature, their seat in an investment bank, or their incentives to keep the C-suite happy and ensure future access to them.<sup>8</sup>

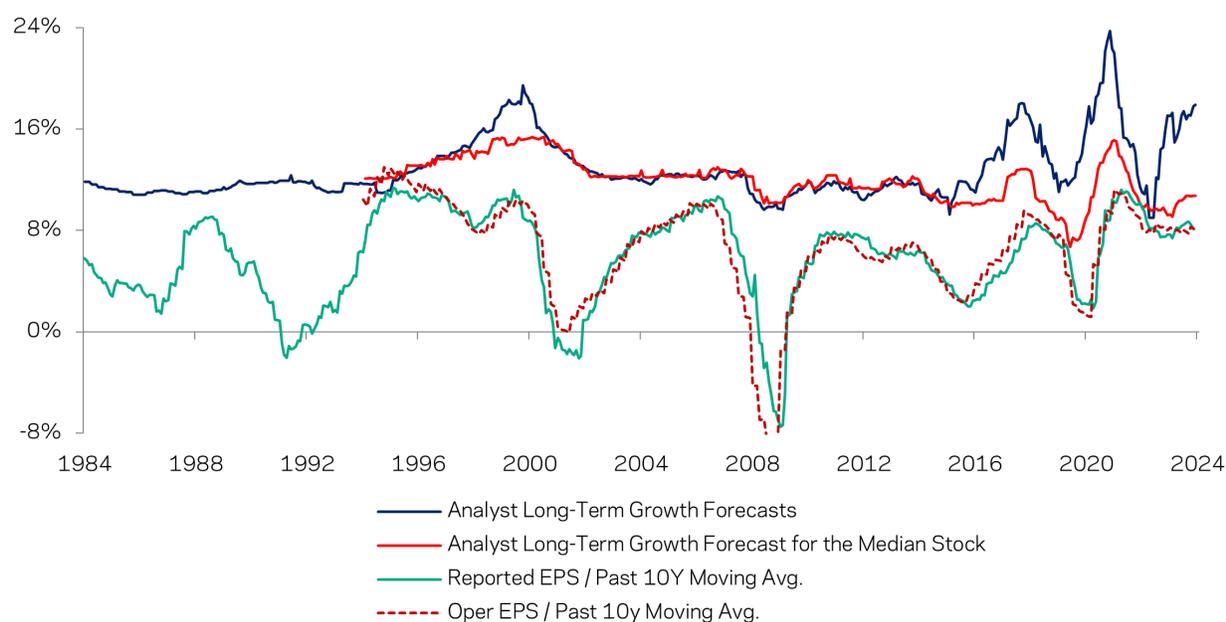
6 You might suspect that I am too sympathetic towards these failed rate forecasters because I shared their mistake. You might be right but while I followed markets closely through these times, I did not need to make rate forecasts. Instead, I have some research pride in having identified another reason than irrationality for the repeated forecast errors: the difficulty of learning about persistent structural changes in the inflation process as (see Box 9.3. in Ilmanen (2011)). Recently, an excellent academic study by Farmer-Nakamura-Steinsson (2024) makes the same argument with much more sophisticated econometric analysis.

7 Since it's debatable how far back these analysts take the rearview mirror, we don't pick a particular starting point. Instead, we compare current earnings level to the 10-year moving average of past earnings. Since this estimate is on average five years stale, we express it as five-year annualized growth rate.

8 In fact, analysts keep the C-suite twice-happy by first being overoptimistic on medium-term and long-term earnings forecasts and then obligingly walking down their estimates in the months before actual earnings announcement. You see, those near-term estimates need to err to the pessimistic side so that the firm's actual earnings can beat the consensus estimate (which happens >70% of the time). See Kothari et al. (2016) and Ed Yardeni's website <https://yardeni.com/charts/sp-500-earnings-squiggles-framework/> for some visual evidence about the regularity of the walkdown path.

## Exhibit 2: Extrapolative Growth Expectations on US Large-Cap Stocks by Equity Analysts

December 1, 1984 - November 30, 2024



Sources: AQR, Credit Suisse, IBES, Robert Shiller's Data Library. Analyst growth forecasts before January 1, 1995 sourced from Credit Suisse. After January 1, 1995, forecasts are sourced from IBES and AQR. EPS data is provided by Robert Shiller's Data Library.

What matters to us here is that the overoptimism is not constant over time. Analyst forecasts in Exhibit 2 are extrapolative—and thus quite poor market-timers. As noted in [Part 1](#), the extreme growth optimism in 2000 and 2021 (and dare we say the start of 2025) peaked with market valuations and preceded sharp market falls. The correlation between past earnings growth and long-term expectations is 0.3, whereas realized earnings growth exhibits negative long-term autocorrelation.

Moreover, a particular overoptimism—a special layer of US exceptionalism—is saved for the mega-cap tech stars. A comparison of the dark blue line for cap-weighted stocks and the red line for the median stock shows a large gap in 1999-2001 and since 2017, in line with wide valuation spreads at these times.

There is other academic evidence of excessive growth extrapolation in equity markets. Single “growth stocks” have enjoyed faster sales or earnings growth in the past and the growth edge exhibits some persistence. Thus, investors rightly expect the growth edge to continue but, unfortunately, they extrapolate the edge too far into the future and price these stocks too dearly. After a few years, such extrapolative growth expectations tend to be disappointed and result in below-market returns for growth stocks.

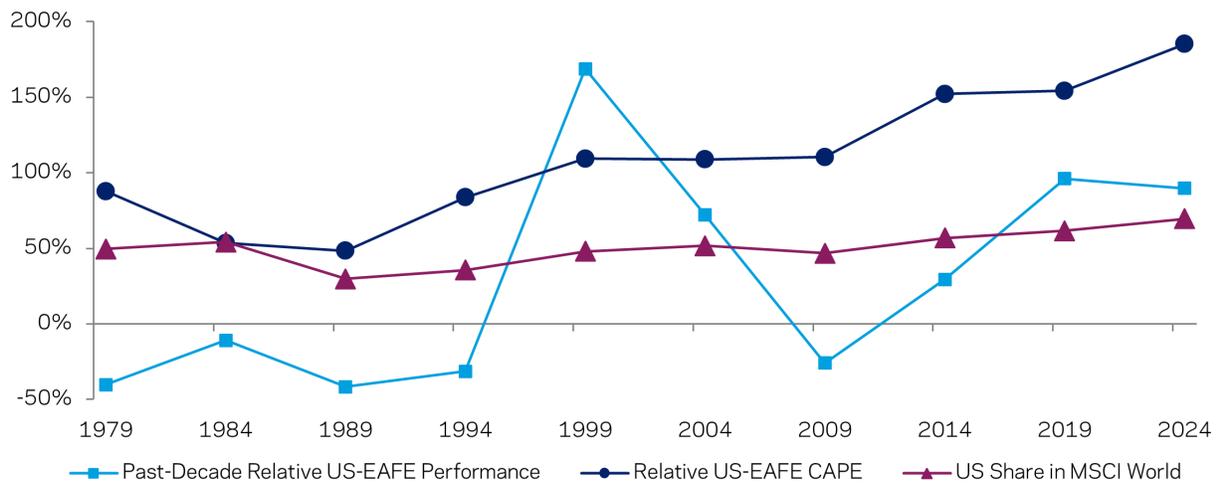
Separately, there is evidence of directional market return extrapolation, especially by retail investors (I'll show this later in the series). [Exhibit 3](#) gives apparent evidence on extrapolative return expectations in equity country allocation. The black line shows that US equities underperformed the rest of the

developed world (mainly Europe and Japan) in the 1970s-80s and again in the 2000-09 decade. These disappointing experiences coincided with a falling relative market valuation of US versus others, as well as falling

or flat share of US in the global developed world index. In contrast, the US-friendly decade of 1990s and the post-2010 period coincided with a rising relative valuation and rising market share.

### Exhibit 3: Extrapolative Return Expectations by Equity Country Allocators

December 1, 1979 - September 30, 2024



Sources: AQR, Bloomberg, MSCI, Reuters. CAPE is the cyclically adjusted price to earnings ratio which is calculated by converting MSCI price to earnings from Reuters into earnings per share using the MSCI price index before adjusting for inflation using CPI from Datastream and taking the inverse of the 10-year average real earnings yield. EAFE CAPE is calculated as the market-cap weighted average of the CAPE of the underlying countries

We discussed the topical tension in [Part 2](#) of this series: most of the US outperformance in recent decades can be attributed to richening relative valuations. In 1990, the US had a cyclically-adjusted price/earnings ratio (CAPE) about half of the remaining developed world, in the 2000s US rose to be slightly richer than the rest, and by the end of 2024 US valuations were nearly twice that of the rest. Those rising relative valuations suggest lesser attractiveness of US equities going ahead, and yet investors collectively have been willing to raise their US allocations to an all-time high 70% of the global equity portfolio. We can

only make sense of these allocation choices if investors assign a record-high prospective growth advantage for the US over others, guided by an extrapolative mindset.

# What Causes This Different Reaction to Past Performance in Bonds and Stocks?

Why is it common to expect reversal in fixed income after a long yield decline but continuation of a long bull market in equities? One plausible explanation is that these patterns have been the historical norm. Yet this claim conflicts with long-run historical evidence in **Exhibit 4**. Total returns of US equities have exhibited decadal reversals (-0.1 autocorrelation since 1800, -0.3 since 1900) and bonds decadal

continuation (+0.5 autocorrelation since 1800, +0.6 since 1900).<sup>9</sup> Clearly this is not the answer.

The last section delves deeper on very long trends of falling real yields and richening asset valuations which partly explain the observed positive autocorrelation for bonds in **Exhibit 4**. It argues that we may have reached some natural limits to asset richening trends.

## Exhibit 4. Historical Patterns Do Not Support Equity Continuation / Bond Reversal Mindset

	Nominal		Real		Inflation
	Equities	Bonds	Equities	Bonds	
<b>Decadal Autocorrelation Since 1800</b>	-0.09	0.49	-0.37	0.31	0.24
<b>Decadal Autocorrelation Since 1900</b>	-0.31	0.57	-0.48	0.24	-0.03

Sources: AQR, Credit Suisse, IBES, Robert Shiller's Data Library. Analyst growth forecasts before January 1, 1995 sourced from Credit Suisse. After January 1, 1995, forecasts are sourced from IBES and AQR. EPS data is provided by Robert Shiller's Data Library.

Instead, I argue that *salience* is a key reason for the difference. Academic research has emphasized the role of information salience (memorability, easy access) in expectations formation.<sup>10</sup> *Bonds are quoted in yields but equities in prices*. Many information sources and market commentaries reinforce the focus on bond yields but on realized equity returns. Bond yields are easy to access and understand, while equity yields, even if available, require academic models which make obscure judgments on how much those yields reflect required returns vs. realistic growth prospects.

A case in point: When investors in the 2020s look back to the 2010s, they tend to recall the low interest rates (ex-ante measure) and the strong equity returns (ex-post measure).

Bond investors find today's interest rates abnormally high and expect rates to mean-revert toward the lower levels of 2010s. This logic explains the 2022-24 yield curve inversion and more generally curve shapes over time (a mostly upward slope from 1983 to 2021). Now, if equity investors shared this contrarian mindset, how would it manifest itself? If investors viewed

<sup>9</sup> Decadal autocorrelations on real returns are even a bit lower for both asset classes. They are even more negative on the relative performance of US vs. non-US equities. Lastly, earlier reports in this series showed that also decadal earnings growth series exhibit negative autocorrelation.

<sup>10</sup> For example, Bordalo-Gennaioli-Shleifer (2022). Bordalo et al. (2024) and Hartzmark-Solomon (2022) on how returns are displayed matters for investor choices.

stocks the same way as bonds, forward-looking estimates would be more cautious after an abnormally bullish decade, predicting softening valuations toward the previous decade's lower levels. That was IF. There is little sign that most equity investors act like this when forming expectations. Their salient memory is not the past cheaper valuations but the strong realized

returns, so they seem more likely to extrapolate multi-year performance.

Investors would do well to bear these tendencies in mind as they form their own expectations for equity and bond market returns and regional prospects for the years ahead. A topical example is the US equity outperformance over the rest of the world, discussed in [Part 2](#) of the series.<sup>11</sup>

## The Really Long View: Should We Expect Asset Richening Trends to Persist?

One might argue that the reason for bond expectations being more contrarian (than stock) is that bond prices are only driven by discount rates, whereas stock prices are also driven by expected cash flows. Discount rate shocks may be inherently self-correcting (lower discount rates imply higher valuations but lower future reinvestment rates, besides any mean reversion), whereas cash flow shocks are not (or are less so).

This downtrend may reflect declining risk in debt and increasing investor patience and risk tolerance due to higher wealth.

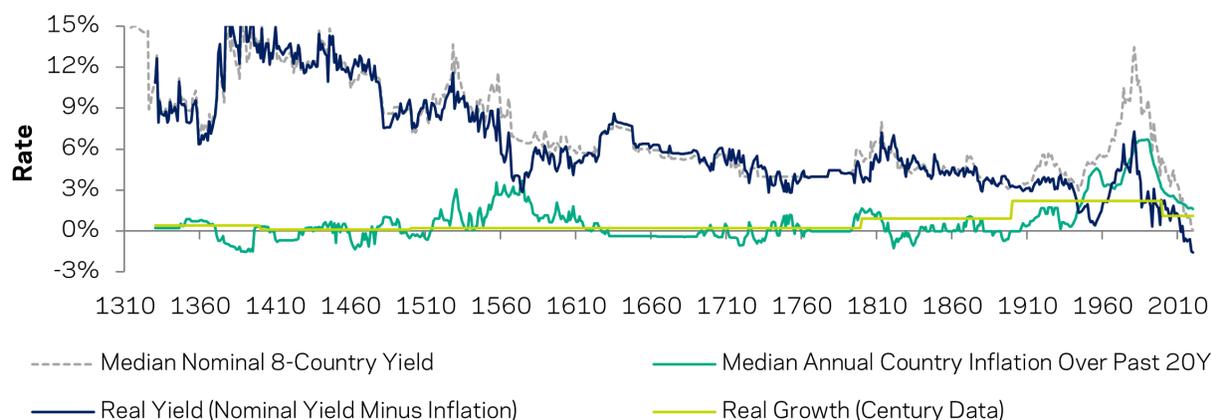
Lower required yields imply higher bond valuations, and lower riskless yields likely boost other assets' valuations. Indeed, later articles in this series will document the richening of US equity valuations over the past century.

However, recent academic research has challenged the notion that real bond yields are mean-reverting. Schmelzing (2020) and Rogoff-Rossi-Schmelzing (2024) document multi-century evidence of ever-falling real bond yields from double-digit rates in the Middle Ages to negative levels in the 2010s (see [Exhibit 5](#)<sup>12</sup>).

<sup>11</sup> See Ilmanen-Maloney (2025).

<sup>12</sup> Exhibit 5 also shows that inflation and real growth hovered near zero before the Industrial revolution, so today's typical macro-stories would not explain well the high real yields of yester-yester. Risk- and patience-related factors likely dominated then but matter less today. In the past century, yields incorporate some learning of the recent inflation and growth environment. Precious metal imports from the Americas and Napoleonic wars raised inflation temporarily above zero, but over the past century, sustained positive inflation has become the norm. World wars, the shift to fiat money, and oil shocks explain the main fluctuations in the one inflation history we study. On the growth front, the 1900s and especially the post-WWII era saw unprecedented global expansion; recent decades have seen a slowdown in both population and productivity growth. Finally, fiscal deficits matter in crises but markets often ignore them for a long time – witness the real yield fall in recent decades despite rising debt levels.

### Exhibit 5. A Really Long History of Downward Trending Yields, 1310-2020



Sources: Schmelzing (2020) and Maddison-Groningen (2020). Notes: Yield and inflation series are medians of annualized rates from up to eight countries (US, UK, Holland, France, Germany, Italy, Spain, Japan) since Schmelzing (2020) data are available, in many cases before the birth of the nation. Nominal Yield refers to long-term loans or bonds, and Real Yield is the difference between nominal yield and median annual country inflation rate over past 20 years. Real GDP growth per capita is from the Maddison-Groningen database for the same countries (GDP-weighted).

Rogoff et al. (2024) acknowledge that real yields may be characterized by both a secular downtrend and cyclical reversals around this trend. Cyclical variations have lengthened from 4- to 5-year business cycles to even decade-long, partly reflecting the shift from the post-WWII inflationary decades to disinflationary decades when debt became more abundant and cheaper, thanks to friendly central banks.

The observed secular downtrends in required asset yields *may have reached some natural lower limits*, which should strengthen reversal tendencies. Two key examples follow:

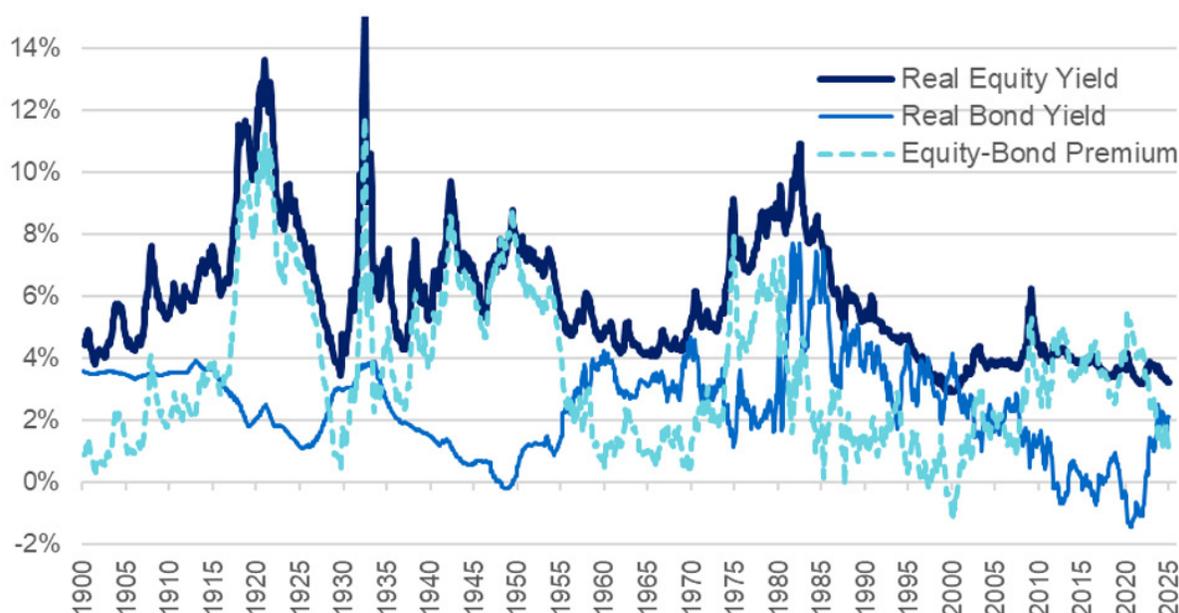
1. It was long believed that *nominal yields cannot be negative*, otherwise people would put money under the mattress instead of into banks or bonds. Yet, the zero-rate boundary proved porous between 2008 and 2021 as bond yields fell to near zero in the US and to negative nominal levels elsewhere. Low inflation expectations helped, but the last mile of the downward journey was falling real yields: at the trough, trillions of dollars of bonds traded at -1% to -2% real yields. Then 2022-23 saw a

sharp correction higher when an inflation spike finally forced central banks to tighten monetary policies. One can still tell stories of how real rates could keep falling to ever-more negative levels, but most observers believe that the secular downtrend in **Exhibit 5** is over. So do I.

2. Another article of faith was that *equities should always offer a positive forward-looking risk premium over bonds*, reflecting the basic risk-reward tradeoff. Yet, some measures of the equity-bond premium turned negative in 1999-2000, mainly reflecting irrational exuberance amid the tech bubble (see **Exhibit 6**). The premium then rebounded and widened in the post-GFC period but has narrowed sharply since 2022.

The real equity yield is mechanically the sum of real bond yield and equity-bond premium, so its natural lower bound reflects both forces above. A further anchor may come from the notion that equities provide levered exposure to economic growth, which suggests something above 2% real.

### Exhibit 6. Expected Real Yields of US Equities and Bonds, 1900-2024



Source: AQR, Robert Shiller Data Library, Federal Reserve Bank of Philadelphia, Blue Chip Economic Indicators, Consensus Economics. Equity Yield is an average of three series based on CAEY, D/P and growth proxies. Real Bond Yield is 10-year Treasury yield minus survey-based estimate of expected long-term inflation. Equity-Bond Premium is difference of first two series.

*What are realistic long-run expectations if we do not assume major valuation trends or reversals?* We try to address this question based on current market yields in our annual capital market assumptions reports, but here I make some comments beyond market yields. Inflation expectations are debatable, but a 2% anchor is supported by central banks unless other forces overwhelm it.<sup>13</sup>

Economic growth has been slowing due to demographics and other headwinds but may be saved by AI (even though measured productivity growth has declined in recent decades). Again, 2% might be a decent anchor for real growth. (It is a coincidence to see 2% for both inflation and growth. In any case, their 4% sum of nominal growth is sometimes seen as an anchor for fair bond yields.) The expected real rate on riskless T-Bills has seen -2% to +2% range in the past decade(s); for the long-run

future, 0-1% seems still a good anchor. Then there are required asset premia beyond those expectations; historically they have been higher but prospectively a term premium near 1% and equity premium of 2-3% (compound return) seem plausible, while required illiquidity premia should eventually rise from near 0% to 2%.

*Why are our expectations more conservative than those of many investors?* Because market yields disagree with the optimistic rearview mirror expectations. Rearview mirror optimism is especially dangerous:

- when recent 30-40-year equity returns are boosted by abnormal earnings growth (due to one-off falls in interest rates and corporate tax rates) and richening asset valuations well beyond sustainable yield + growth;

<sup>13</sup> This seems a real possibility in 2025, when US economic policies and threats to the Fed's independence might unleash the de-anchoring of long-run inflation expectations.

- when even economic growth has been boosted by more debt and cheaper debt (until recently) rather than by measured productivity growth;
- when debt dependence (already-high public and private debt levels) coincides with large future obligations related to demographics, defense, decarbonization as well as elevated geopolitical and macro uncertainty;
- when elevated valuations for risky assets (less so for govts) still point to low portfolio expected return; and
- when many investors' key answer to this challenge is to boost private asset allocations together with wishful thinking on illiquidity premia and positive-alpha-for-all.

Easy to sound like Cassandra here. I asked ChatGPT if AI would come to the rescue. It wasn't sure.

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