



July 2025

Equity Market Focus: Interrogating the Historical Data

Understanding Return Expectations, Part 5

Executive Summary

Historical average returns can be useful estimates of future expected returns (only) if expected returns are constant and the sample is unbiased. For US equities, long-run average real return is near 7%, but prospects are lower.¹ A decomposition of S&P500 returns into yield, growth, and valuation change effects is instructive. The most relevant predictor, the equity market's starting yield, is historically low, while the less sustainable contributions of growth and repricing have risen in recent decades.

¹ See Exhibit 2 below. Past performance is not a guarantee of future performance.

Antti Ilmanen
Principal and Global
Co-Head of Portfolio
Solutions Group

The author thanks his colleagues, especially Thomas Maloney, for helpful discussions and comments.

Why Look Back?

After covering a range of topics on *Understanding Return Expectations* (a series overview, the US versus rest-of-the-world opportunity, different expectations formation patterns in equity and bond markets, and a history of long-run return expectations), the series now addresses equity market return in more detail, from three distinct angles. Part 5 focuses on the historical record, while Parts 6 and 7 will cover valuation-based (objective) and survey-based (subjective) expectations, respectively.

Equity investors can use the market's history to guide their expectations if they assume prospectively a constant real return or premium, but it is unclear how long history they should use.² Even if they don't make this assumption, both systematic and discretionary forward-looking analysis can benefit from a better understanding of the market's drivers. Market returns can be decomposed in many ways; we'll use the three-part decomposition we introduced in [Part 2](#):³

Real Return \approx Dividend yield income + Real EPS growth + Change in valuation

We'll now focus on the U.S. equity market, performing this decomposition over different sample periods and discussing how these

histories can guide forward-looking analysis. Some components are "stickier" than others and thus more worth extrapolating. The more past returns reflect yield income and growth rather than repricing, and the more "normal" current yields and growth expectations are by historical standards, the more reliably investors can extrapolate past performance into the future.

Unfortunately, even decadal past returns tend to be dominated by valuation changes, and these are more likely to revert than continue across decades. Perhaps worse for investors in 2025, yields are historically low (and valuations high), while recent decades' exceptional growth has led to high subjective expectations.

As discussed in [Part 1](#) and [Part 2](#), analysis of historical data suggests that 2025 is a particularly dangerous time to rely on rearview-mirror expectations, especially if the rearview focuses on the recent (say, past decade) period of strong growth and rising valuations. In short, US market bulls have been right for 15 years, an exceptionally long time, and they may continue to be right, but the longer historical record is not on their side.⁴

2 A too-short history is dominated by noise from unexpected returns and a biased sample. A too-long history may contain data that is no longer relevant if the investment world has changed structurally in relevant ways. We favor studying long data sets though do not necessarily suggest that distant data should get an equal billing to more recent data.

3 Some technical details: This decomposition is really an accounting identity based on the definition of returns as a sum of income yield and capital gains. It is in the spirit of the dividend discount model, but we use it with Shiller's cyclically-adjusted price-to-earnings ratio (CAPE) valuations and corresponding 10-year smoothed real earnings-per-share (EPS) growth. It could be a classic "Gordon growth model" with constant growth rates, payout rates and required returns, or a more dynamic Campbell-Shiller (1988) model with time-varying relationships and some loglinear approximations (some terms should actually be multiplied or logged, but we sum them here). Returns can be real or nominal and realized or expected (the equation can be converted to rational expected returns by taking expectations of both sides). See pp. 64-5 and 174-5 in Ilmanen (2022) for more details.

4 See [Part 2](#) of this series for a fuller discussion of US versus non-US equity market prospects.

Looking for Patterns

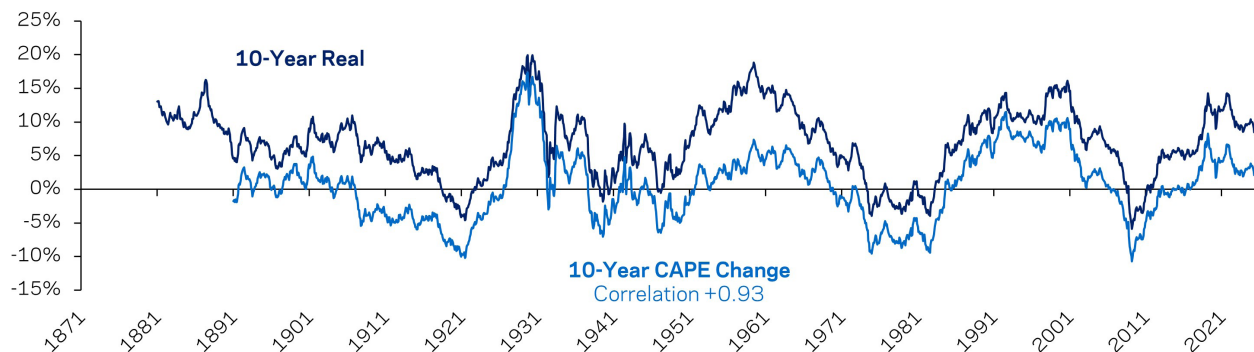
Let's go to the data. Over the very long run, US equities have earned almost 7% real annual compound return (see Exhibit 2), and rolling 10-year returns have rarely been negative (dark blue line in Exhibit 1 A and B). However, even decadal returns vary a lot over time, ranging from -5% to +20% annual returns (and the record is worse outside US). If you don't care about the distant past, you can focus on the right portion of each chart.

By comparing the two charts, we can clearly see that decadal market returns are driven more by contemporaneous valuation changes (correlation 0.93) than by variations in EPS growth (0.39). The discount rate effect is powerful: rising valuations, i.e., falling expected returns or equity discount rates (lower CAEY = $1/CAPE$) gave windfall gains that boosted realized annual real returns to double-digit levels in the 1920s, 1950s, 1980s, 1990s and 2010s. Conversely, falling valuations pushed realized real returns to negative levels in the 1910s, 1930s, 1970s and 2000s.

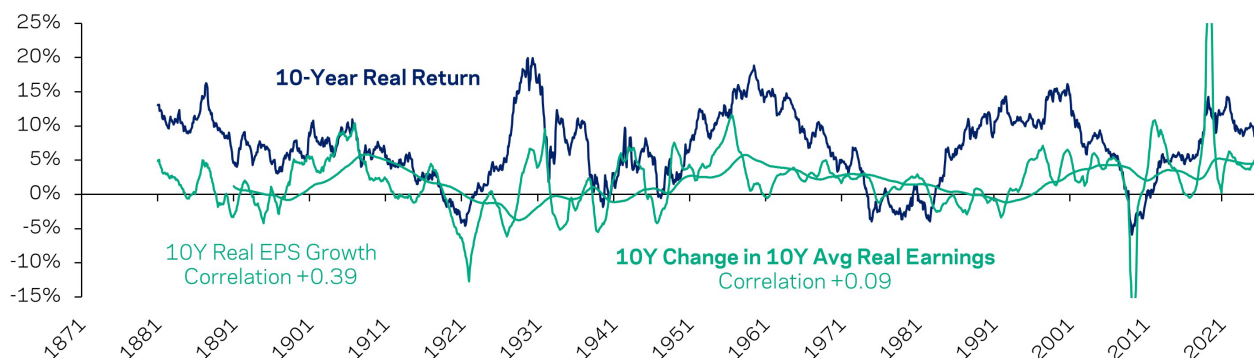
Exhibit 1. Major Drivers of Equity Market Returns

January 1, 1881 - June 30, 2025

A: Valuation Changes Drive (Contemporaneous) Decadal Market Returns



B: Earnings Growth Matters Less for (Contemporaneous) Decadal Market Returns



Sources: AQR, Professor Shiller's website. All series are for the S&P 500. CAPE is cyclically-adjusted price-to-earnings ratio (price over past-decade's inflation-adjusted average annual earnings). EPS is earnings per share.

Our focus is on understanding and explaining contemporaneous relationships, but let's detour briefly to predictive analysis. We showed in [Part 1](#) that low decadal returns are often preceded by high valuations (predictive correlation of CAPE with next-decade real market return is -0.51) and by strong previous-decade returns (predictive autocorrelation -0.37). Extrapolating strong past market performance is especially dangerous if it reflects high and rising valuations, but high past-decade EPS growth is not much better (predictive return correlation -0.21 and growth autocorrelation -0.28). Yet many analysts and investors seem to overextrapolate past growth.

Back to contemporaneous analysis. **Exhibit 2** shows return decompositions for different historical periods all ending in June 2025, and

with the following start dates: the beginning of the full sample in 1881, a century ago, the post-WWII CAPE trough in summer 1982 when Volcker's Fed began a long easing period, and a decade ago. The last four rows give four more subperiods: the 19th century, two halves of the 20th century, and the first quarter of the 21st century (which started near the post-WWII CAPE peak in 2000).⁵

For example, the century-long sample 1925-2025 shows that half of the 7.3% real return could be attributed to the dividend yield; real EPS growth added near 2%, and the impact of multiple expansion was a sizeable 1.3% per annum—even over a century—as CAPE richened from 9.8 to 36.2. Extrapolate this last component - which is much larger for the more recent samples—at your peril.

Exhibit 2. S&P 500 Real Return Decomposition Over Different Periods

January 1881 to June 2025

Sample Periods Ending Jun-2025	Real Return	Average D/P	Real E10 Growth	Valuation Change
1881 - 2025	6.6%	4.1%	1.9%	0.5%
1925 - 2025	7.3%	3.6%	2.1%	1.3%
1982 - 2025	9.3%	2.3%	2.7%	4.0%
2015 - 2025	9.7%	1.7%	4.6%	3.2%
Subperiods				
1800 - 1899	5.9%	5.7%	ca. -0.5%	0.7%
1900 - 1949	5.3%	5.4%	1.0%	-1.1%
1950 - 1999	9.1%	3.7%	2.1%	2.9%
2000 - 2025	5.0%	1.6%	4.0%	-0.8%

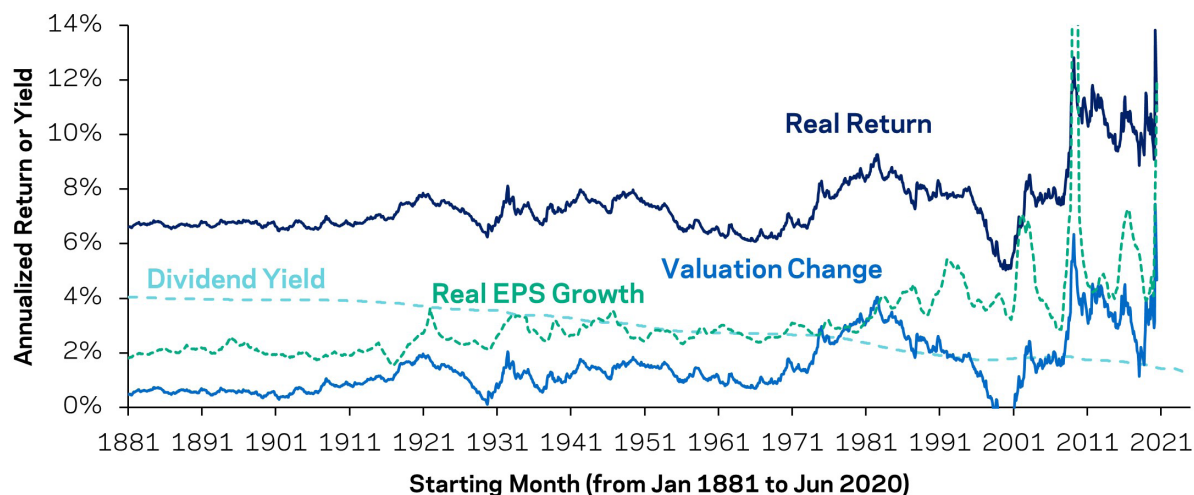
Sources: AQR, Professor Shiller's website, McQuarrie (2024). All calculations based on Shiller's data set, bar the 1800s row from McQuarrie. Decomposition math is not perfect due to compounding effects. With yield income (D/P) it is debatable whether to use average or starting value; over long horizons reinvestments make the average more relevant, so we use it. Growth uses 10-year smoothed real earnings to be consistent with Shiller CAPE (P/E10) as the valuation metric. All series but average D/P are converted to annualized compound rates of return (geometric means). Past performance is not a reliable indicator of future performance.

5 For insightful examples of more elaborate decompositions, see L'Her et al. (2018) and Mauboussin-Callahan (2023).

You can pick your preferred window among the rows in Exhibit 2. In **Exhibit 3** we give even more options and present the decomposition visually, which will help interpret historical evolutions. This exhibit shows the “backward-expanding” average annualized return for each series, always ending in June 2025 but starting the sample in any month between 1881 and mid-2020. You can infer from right to left the impact of extending the sample further back in time.⁶

If your rearview mirror perspective begins any time after the 2008 Global Financial Crisis, you see double-digit real returns. This chart might disabuse you from such optimism by reminding you that (i) longer histories point to single-digit real returns near 7%, (ii) recent returns were so high due to both rising valuations and exceptionally benign growth environment, and (iii) current high valuations imply yield income well below long-run norms even if the coming years don’t bring the pain of mean-reverting valuations.⁷

Exhibit 3. S&P 500 Real Return Decomposition: Backward-Expanding Averages January 1881 (or later) to June 2025



Sources: AQR, Professor Shiller’s website. For notes, see below Exhibit 2. All samples end in June 2025.

Here are a few big-picture takeaways from the decomposition in Exhibit 3:

- Realized average returns have moved closely with the impact of valuation changes, as was already seen with decadal returns in Exhibit 1. Let’s return to this point later.

6 This chart type is useful when you want to end with the latest observation, but are less sure when to start. One downside is that observations are not independent: the sample always ends in mid-2025 at high valuations after some capital-friendly decades. There are many other design choices when plotting historical returns. Returns may be annualized or cumulative – the latter is often preferred when presenter wants to highlight the large compound edge of one investment over another. A log scale is usually preferable for analyzing compound returns (it gives all parts of the history equal visual weight) but some presenters use a linear scale to highlight the impact of compounding. It can be helpful to remove some common element like inflation, or to study relative performance. Finally, with decompositions, it is worth exploring whether the components are better shown individually or stacked.

7 Studying just the top line in Exhibit 3 might make you think that assuming 6% real market return for the future is conservative because the range for different sample periods give is roughly 6-12%. However, this is misleading because all samples end at the benign high-valuation 2025. Even a peek at Exhibit 1 would remind you that historically about half of decadal return experiences have been below 6% real. Worse, the forward-looking picture starting from 2025 may not match long-run norms given the high valuations and thus low starting yields. Brooks (2023) offers a related take on the dangers of a rearview-mirror perspective in this situation.

- The impact of dividend yield income has trended lower and the impact of growth has trended higher if we move from left to right, to shorter (more recent) sample periods. The sum - yield-plus-growth - is nearly flat.
- The lower average dividend income in more recent samples reflects both the general equity richening over time (all market multiples have risen) and the particular impact of share buybacks replacing dividends as payouts.⁸
- The higher average EPS growth in more recent samples warrants its own section.

But first: Undoubtedly you are all now thinking “But what happened in the 1800s?”

Why doesn't the Shiller data set go back even further?”⁹ Fortunately, there is more and better analysis available on distant histories published by authors like Ed McQuarrie and Bryan Taylor. Chambers et al. (2024) recently surveyed the evidence on very long-run asset returns, acknowledging lower data quality and relevance (if the world has changed) but highlighting important substantive results. The big picture of the 1800-99 period is that both US stocks and bonds promised and delivered about 6% return, so there was virtually no premium between the two asset classes,¹⁰ and very similar nominal and real returns amid near-zero inflation. Moreover, income yields explain nearly all of the realized return over the century.¹¹

Is Faster Earnings Growth Here to Stay? The Message from the Data

Long-run real EPS growth in the US has averaged near 2% but has been edging higher over time, clocking near 4% in the 21st century so far. There are some arguments for this rapid growth to persist, such as the greater use of share buybacks (which boosts EPS as the share count falls). Then there are the counterarguments: Smolyansky (2023) shows

that the doubling of EPS growth rate since the late 1980s can be mostly explained by sharp falls in corporate tax rates and interest rates which should hardly be extrapolated.

These lower interest rates and corporate tax rates were part of a capital-friendly policy environment, which along with globalization

8 Net issuance was 1-2% per annum for much of the 1900s, but has been closer to zero in the 2000s due to the growing use of buybacks.

9 Or perhaps not, but maybe you should be. If you use a rearview mirror, make its view long (not just a few years or past decade) and broad (not just the US - but that's for another day). Those who don't know their history..

10 The lack of meaningful equity-bond premium partly reflects the riskiness of bonds in the 1800s (US government bonds were not perceived riskless until the early 1900s) as well as slower growth. Still, bond volatility was almost half that of stock volatility (7% vs 13%) in the 1800s, so the similarity in returns for the two asset classes is surprising.

11 Sources differ on whether stocks or bonds earned a bit more, on whether stock price gains were mildly positive or negative, and on whether there was mild inflation or deflation over the century -- but in all cases the debates are within +/-1% p.a., so they hardly change the big picture. Specifically, McQuarrie's (2024) data show 5.5% nominal (5.9% real) return for equities and 6.2% for bonds, thus a -0.6% equity-bond premium. Taylor's (2023) data show somewhat higher equity returns and lower bond returns, thus a positive equity-bond premium of 1.2% (and a similar premium in the UK). McQuarrie (2021) shows that the US dividend yield (averaging 5.7% over the century) fully explains the 1800s equity return, but its contribution fell through the 1900s. Both dividend yield and bond yield fell over the 1800s, roughly halving from 6% to 3%. The resulting repricing gain of 0.7% p.a. for stocks was offset by a negative growth impact as many companies failed. We include one speculative row in Exhibit 2 for the 1800s using McQuarrie's data; the growth impact is inferred from the other series.

and technological advances gave a strong tailwind to companies and equity markets since the 1980s. Exhibit 4 shows that S&P 500 EPS growth has clearly outpaced economic (GDP) growth since 1990, while the opposite was true in the post-WWII decades. The pattern is even stronger for corporate profits in the national accounts, resulting in a high share of capital versus labor income and persistently high profit margins.¹² Similar

growth patterns show up in dividends and operating or “Street” earnings (see Part 6 for a discussion of different earnings metrics). Smolyansky stresses that EBIT growth (earnings before interest and taxes) has been better anchored near 2% real, while one-way interest rate and corporate tax rate trends explain recent strong decades for EPS growth (as well as the weak preceding decades).

Exhibit 4. Exploring the Stability of US Real Growth Rates Over Time January 1871 to December 2024

	DPS	Reported EPS	Street EPS proxy	EBIT (nonfin)	Corp Profit	GDP	CPI Inflation
Jan 1871 - Dec 2024	1.6%	2.0%					2.1%
Jan 1871 - Mar 1947	0.6%	0.8%					0.7%
Mar 1947 - Dec 2024	2.6%	3.2%			3.1%	2.8%	3.5%
Mar 1947 - Dec 1989	2.3%	2.7%			1.7%	3.4%	4.2%
Mar 1965 - Dec 1989	0.4%	0.9%	1.1%	1.8%	1.1%	2.9%	5.7%
Dec 1989 - Dec 2024	2.9%	3.8%	3.9%	2.1%	4.8%	2.1%	2.7%

Sources: Professor Shiller’s website, St Louis Fed’s FRED database, Smolyansky (2023), Hillenbrand-McCarthy (2024). Dividend-per-share (DPS), reported earnings-per-share (EPS), and CPI inflation are from Shiller, Street EPS is from Hillenbrand-McCarthy, earnings before interest and taxes (EBIT) for non-financial firms is from Smolyansky, Corporate Profit and GDP from FRED. All compound growth series are deflated with CPI for consistency.

Thus, while the full-history anchor of 2% real EPS growth could be too conservative, the 3-5% real growth from recent decades is likely unsustainable and a poor guide for the future. Of course, artificial intelligence (AI) or Trump 2.0 economic policies may cause further surprises in the coming years. In the spirit of a pre-mortem, if we are proved wrong and see rapid growth for the next decade, AI

is most likely to be the catalyst. We merely note that AI’s productivity tailwinds will have to overcome headwinds from several “Ds”: demographics and deficits for sure, maybe also defense, deglobalization, and decarbonization. Exhibit 4 reminds us that EPS growth rates before 1947 (when national accounts statistics became available) were much more modest.

¹² Corporate profits in the national accounts cover the whole corporate sector, public and private, not just the S&P500 universe. Importantly, it is based on very different data sources than EPS. Put simply, firms have incentives to play up their earnings to boost the share price but to play down their taxable profits.

The experience of other countries – few have as wonderful growth history as the US – reinforces our choice to anchor near 2% real.¹³ Looking back, one can fairly debate how much US outperformance reflects sustainable edges related to corporate-friendly institutions and entrepreneurial spirit, and how much one-off

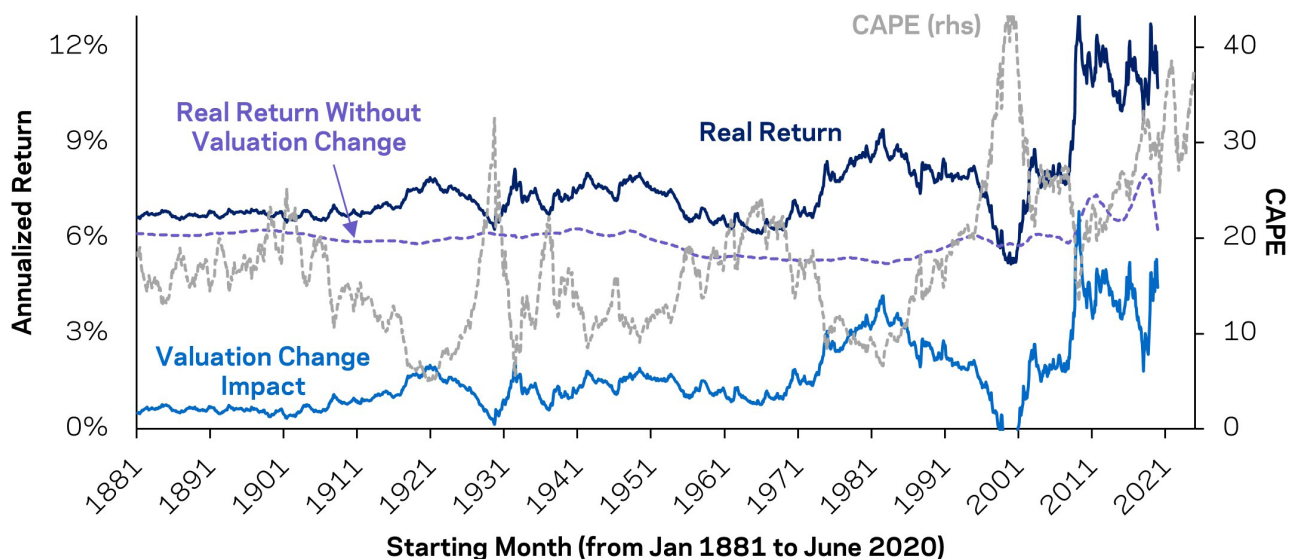
luck (having avoided calamities such as a war on its own soil, hyperinflation, or revolution). Looking ahead, wide valuation gaps persisting in 2025 suggest investors have over-extrapolated the recent US growth edge, as we discussed in [Part 2](#).

Impact of Valuation Changes

Lastly, we examine the impact of valuation changes. Exhibit 5 shows that with the impact of valuation changes removed, the historical average return (purple dashed line) is near 6% real for any backward-expanding period except the most recent era. The back-expanding

impact of repricing (mid-blue line) is largest for the recent period of richening, but also has surprisingly long legs. Who would have guessed that even over a 100-year period, around one fifth of the market's real return of 7.3% is attributable to rising valuations?

Exhibit 5. Backward-Expanding Return With and Without Impact of Valuation Change
January 1881 (or later) to June 2025



Sources: AQR, Professor Shiller's website. For notes, see below Exhibit 2. All samples end in June 2025.

¹³ I emphasize in my books that 2% real compound growth can equate to 7-8% nominal arithmetic growth, so the assumption is not as stingy as it first sounds. I also emphasize that any debates about numbers should start with a clarifying discussion on what is being measured – the gory details of arithmetic vs geometric, nominal vs real, etc., matter quite a bit.

Valuation changes are hard to predict¹⁴ and, if anything, the long-run history suggests mild decadal mean-reversion patterns. When the opposite happens and rich assets get richer, as was the case in the past decade, yield-based forecasts (the subject of Part 6) can dramatically undershoot return outcomes. But these are probably the worst possible moments to abandon them in favor of an extrapolative approach. Hopefully we hammered that point home earlier in the series!

If investors use historical average returns to guide future expectations, we suggest they adjust the history for valuation changes¹⁵ and/or use a long history where market repricings have a smaller annualized impact.¹⁶ These choices help to give a better estimate of the

returns investors tended to require in the past, on average. But they can still give a poor forecast for the future if today's valuations are far from the historical average. In that case, it is better to use forward-looking estimates such as CAEY—unless you are convinced that the higher valuations today reflect *realistically* higher growth prospects than in the past (and thereby offset the lower dividend/earnings yields).

The dashed blue line in Exhibit 5 is nearly flat, but its forward-looking counterpart – yield plus growth, with zero expected valuation change – varies substantially over time. In Exhibit 2 of [Part 2](#), our yield-based estimate of objectively feasible next-decade real return had a 3-8% range. More on this in the next paper.

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14 Turning points appear obvious with hindsight but are much harder to identify in real time. True seers can get very rich.

15 That is, use the dashed blue line in Exhibit 5. A similar suggestion is made in Asness (2021).

16 Beware shorter windows: past-decade returns and EPS growth have historically exhibited more of a reversal than a continuation tendency.

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