AQR Alternative Thinking 2025 Issue 1

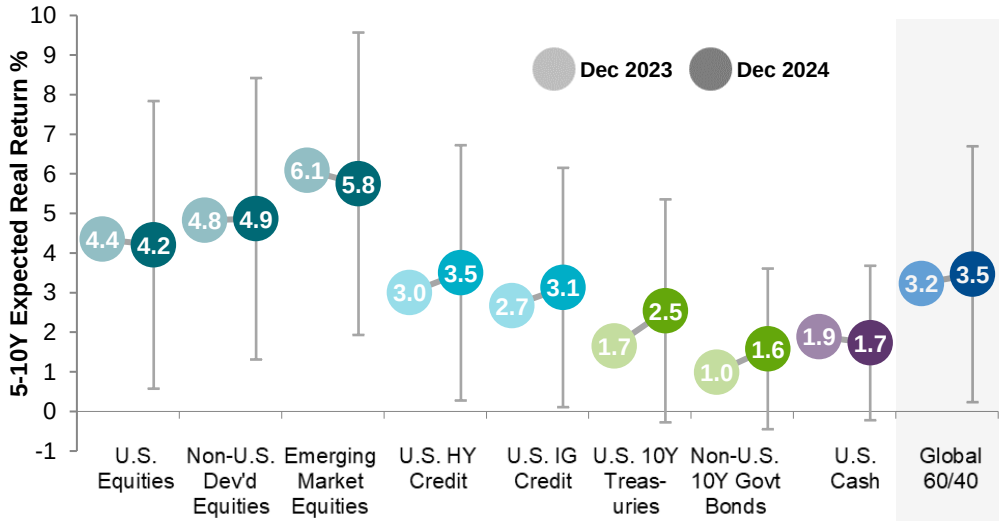
Capital Market Assumptions for Major Asset Classes

Executive Summary

This article updates our estimates of medium-term (5- to 10-year) expected returns for major asset classes. Selected estimates are summarized in **Exhibit 1**. In 2024, equity markets rallied for a second consecutive year but our expected returns – based on current valuations – continue to imply risk premia are compressed. The expected real return of a global 60/40 portfolio has risen to 3.5%, driven by bonds. This is around 1.5% higher than the all-time low reached in 2021, but still well below the long-term U.S. average of nearly 5% since 1900.

The article also includes a discussion on **corporate earnings growth**: the market consensus is for more strong growth to come – especially in the U.S. But what is a reasonable medium-term forecast for allocators?

Exhibit 1: Medium-Term Expected Real Returns Summary



Source: Bloomberg, Consensus Economics and AQR; see Exhibits 3-9 for details. Estimates as of December 31, 2024. "Non-U.S. developed equities" is cap-weighted average of Euro-5, Japan, U.K., Australia, Canada. "Non-U.S. 10Y govt. bonds" is GDP-weighted average of Germany, Japan, U.K., Australia, Canada. Global 60/40 is 60% global developed equities, 40% global developed government bonds. Previous year's estimates are calculated using current methodology. Error bars cover 50% confidence range, based on historical analysis (see Appendix), and are intended to emphasize uncertainty around point estimates. Estimates are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any portfolio that AQR currently manages.

PSG
Portfolio Solutions Group

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About the Portfolio Solutions Group

The Portfolio Solutions Group provides thought leadership to the broader investment community and custom analyses to help AQR clients achieve better portfolio outcomes.

We thank Alfie Brixton, Pete Hecht, Antti Ilmanen, Thomas Maloney and Nick McQuinn for their work on this paper. We also thank Dan Villalon for helpful comments.

Introduction and Framework

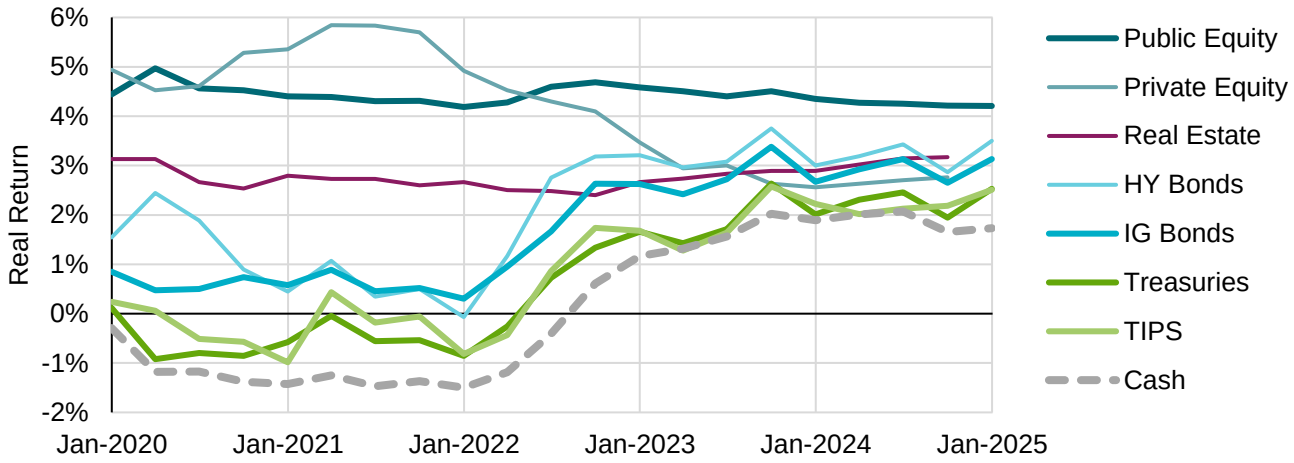
For the past 11 years, we have published our capital market assumptions for major asset classes with a focus on medium-term expected returns (all past reports are available here). Each year, besides the updated estimates, we provide additional analysis or other new material. This year's article includes a section discussing how to estimate earnings growth, a crucial input for equity market expected returns.

As usual, we present local real (inflation-adjusted) annual compound rates of return for a horizon of 5 to 10 years. Over such intermediate horizons, starting valuations tend to be useful inputs. For multi-decade forecast horizons their impact is diluted, so theory and long-term historical averages may matter more in judging expected returns (see last year's special topic). At shorter horizons, returns are largely unpredictable and any predictability has tended to mainly reflect momentum and the macro environment.

Our estimates are intended to assist investors with setting medium-term expectations. The frameworks we present are backed by empirical evidence,[1] but estimates are highly uncertain, and not intended for market timing. As one cautionary example, the error ranges shown in Exhibit 1, based on historical analysis, suggest there is a 50% chance that realized equity market returns over the next 10 years will under- or overshoot by more than 3% per annum.

Expected real returns for bonds and cash rose sharply in 2022 and 2023 from all-time lows in 2021 (see **Exhibit 2**). By contrast, expected returns for equities have remained fairly constant, implying a world of compressed risk premia at the start of 2025.

Exhibit 2: Expected Real Returns for U.S. Asset Classes Dec 31, 2020 - Dec 31, 2024



Source: AQR; see Exhibits 3-8 for details. Estimates are based on current methodologies, are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any portfolio that AQR currently manages.

Public Equity

Our starting point for equity markets is the dividend discount model, under which expected real return is approximately the sum of dividend yield (DY), expected growth (g) in real dividends or earnings per share (EPS), and expected change in valuation (Δv), that is: $E(r) \approx DY + g + \Delta v$.

[1] See for example Ma et al. (2024) "Estimating Long-Term Expected Returns", and analysis in the 2018 edition of this report.

We assume no mean reversion in valuations, i.e., $\Delta v=0$.[2] We take the average of two approaches:[3]

Earnings-based: The inverse of the Shiller CAPE ratio (cyclically-adjusted P/E), CAEP, is 10-year average inflation-adjusted earnings divided by today's price. We multiply this by $1+(g_{EPS}*5)$ to account for earnings growth during the 10-year window, and then by 0.5 (roughly the U.S. long-run dividend payout ratio). We add real EPS growth of 1.8% for developed markets (roughly the 100-year U.S. average), and 2.2% for U.S. small caps and emerging markets. So, our earnings-based expected return is: $E(r) \approx CAEP*(1+(g_{EPS}*5))*0.5 + g_{EPS}$

Payout-based: We estimate net total payout yield (NTY) as the sum of current dividend yield and 10-year smoothed net buyback yield (NBY). To this we add an estimate of long-term real growth of aggregate payouts that includes net issuance. This country-specific growth estimate, g_{TPagg}, is an average of (1) smoothed historical 30-year aggregate earnings growth and (2) forecast 10-year GDP growth. So, our payout-based expected return is: $E(r) \approx NTY + g_{TPagg}$, where $NTY = DY + NBY$

This year we increase the simple long-term growth estimate used in the earnings-based approach from 1.5% to 1.8%, and we change our methodology for estimating country-specific historical earnings growth in the payout-based approach.[4] These changes result in somewhat higher growth estimates, with the U.S. benefiting most.

Real return estimates were little changed in 2024, with higher growth forecasts offsetting richer valuations (see **Exhibit 3**). According to our framework, the U.S. has a sizeable growth advantage over other developed countries, but not nearly as much as priced by markets, giving it the lowest expected real and excess return (see Special Topic).

Exhibit 3: Expected Local Real Returns for Equities as of December 31, 2024

	1. Earnings-Based		2. Payout-Based				Combined		
	CAEP	$CAEP_{Adj.}$ *0.5 + g_{EPS}	Dividend Yield	NBY	g_{TPagg}	DY+NBY + g_{TPagg}	Real Return	*1yr Change*	Excess-of-Cash
U.S. Large	2.8%	3.3%	1.3%	0.5%	3.3%	5.1%	**4.2%**	*-0.1%*	2.5%
U.S. Small	5.2%	5.0%	1.6%	-0.8%	3.9%	4.8%	**4.9%**	*+0.1%*	3.2%
Eurozone	4.6%	4.3%	3.2%	-0.4%	2.7%	5.5%	**4.9%**	*+0.2%*	4.2%
U.K.	5.6%	4.8%	3.8%	-0.8%	2.4%	5.4%	**5.1%**	*+0.1%*	3.0%
Japan	4.3%	4.1%	2.2%	0.5%	2.8%	5.5%	**4.8%**	*0.0%*	5.7%
Glob. Dev. ex US	4.6%	4.3%	3.0%	-0.4%	2.7%	5.4%	**4.9%**	*0.0%*	4.3%
Global Developed	3.2%	3.5%	1.7%	0.3%	3.2%	5.2%	**4.3%**	*-0.1%*	2.9%
EM ex China	5.2%	5.4%	2.6%	--	*3.2%*	5.7%	**5.6%**	*-0.2%*	3.6%
China	8.8%	6.4%	2.5%	--	*3.5%*	6.0%	**6.2%**	*-0.5%*	6.4%
All Emerging Mkts	6.4%	5.7%	2.5%	--	*3.3%*	5.8%	**5.8%**	*-0.3%*	4.4%
Global All Country	3.5%	3.7%	1.8%	--	--	5.3%	**4.4%**	*-0.1%*	3.0%

Source: AQR, Consensus Economics, Bloomberg. Estimates and methodology as of December 31, 2024. See main text for methodology. For earnings yield, U.S. LC is based on S&P 500; U.S. SC on MSCI US Small Cap; U.K. on FTSE 100; Eurozone is a cap-weighted average of large-cap indices in Germany, France, Italy, Netherlands and Spain; Japan is Topix; Emerging Markets is MSCI Emerging Markets Index. For payout-based estimates, all countries are based on MSCI indices. Global estimates are cap-weighted averages. For emerging markets, payout-based estimate is dividend yield + forecast GDP per capita growth. Excess-of-cash return is calculated by subtracting real cash return estimates described later in the article. Estimates are for illustrative purposes only, are not a guarantee of performance and are not representative of any portfolio that AQR currently manages.

[2] See the 2015 edition for a discussion of mean reversion in market valuations, and our decision to exclude it. Briefly, the timing is difficult to forecast, and there are plausible arguments for asset yields not reverting to historical levels.

[3] See the 2017 edition for details and discussion of the methodology.

[4] Specifically, we calculate rolling 30-year EPS growth for each developed market, apply 10-year smoothing to reduce impact of start and end dates, and shrink halfway to a global average. We add 30-year average global net issuance, currently 1.4%, as a "rough and ready" adjustment to convert EPS growth to aggregate earnings growth.

Government Bonds

Government bonds' prospective medium-term nominal total returns are strongly anchored by their yields. The so-called *rolling yield* measures the expected return of a constant-maturity bond allocation assuming an unchanged yield curve. For example, a strategy of holding constant-maturity 10-year U.S. Treasuries has an expected annual (nominal) return of 4.9%, given the starting yield of 4.6% and expected capital gains of 0.3% from rolldown as the bonds age. **Exhibit 4** shows current local rolling yields for six countries, converted to local real returns by subtracting a survey-based forecast of next 10-year inflation. This year we also include expected returns for U.S. and global aggregate bond benchmarks.

We also show expected excess-of-cash returns, which are effectively the returns accessed by hedged investors irrespective of their base currency (assuming zero cross currency basis). While real returns are often the appropriate unit for assessing expectations versus investment objectives, excess-of-cash returns are more relevant for making international allocation decisions, and for investors with access to leverage.

During 2024 most estimates increased, adding to the previous two years' increases. Higher yields and improved rolldown were the main contributors. All major markets now have a positive expected local real return, with some offering 2–3% above expected inflation. Estimates of bond risk premia or excess-of-cash returns have also risen as yield curves steepened.

Any adjustment to these expected returns boils down to expected changes in the yield curve level or shape. Capital gains/losses due to falling/rising yields dominate returns over short horizons but are hard to predict, and matter less over longer horizons.

Exhibit 4: Expected Local Returns for 10-Year Government Bonds as of December 31, 2024

	Y	RR	I	Y + RR - I		
	Nominal Yield	Rolldown Return	10-Year Forecast Inflation	Expected Local Real Return	*1yr Change*	Excess-of-Cash Return
U.S. 10-Year	4.6%	0.3%	2.3%	**2.5%**	*+0.9%*	0.8%
Japan 10-Year	1.1%	0.8%	1.7%	**0.2%**	*+0.3%*	1.1%
Germany 10-Year	2.4%	0.6%	2.0%	**0.9%**	*+0.7%*	0.3%
U.K. 10-Year	4.5%	0.4%	2.1%	**2.8%**	*+1.1%*	0.7%
Australia 10-Year	4.4%	0.5%	2.5%	**2.4%**	*+0.7%*	0.9%
Global Dev. 10-Year	3.9%	0.4%	2.2%	**2.2%**	*+0.8%*	0.8%
Global Dev. ex U.S.	3.0%	0.6%	2.0%	**1.6%**	*+0.6%*	0.9%
U.S. Aggregate	*4.6%*	*0.3%*	*2.3%*	***2.9%***	*+0.5%*	*1.1%*
Global Aggregate	*3.3%*	*0.4%*	*2.1%*	***2.0%***	*+0.3%*	*0.5%*

Source: Bloomberg, Consensus Economics and AQR. Estimates as of December 31, 2024. "Global Developed" and "Global Developed ex US" are GDP-weighted averages. U.S. and Global Aggregate are based on the corresponding Bloomberg indices (durations 6.1 and 6.7 years), and also include convexity and variance terms as described overleaf for credit indices. Rolldown return is estimated from fitted yield curves and based on annual rebalance. Excess-of-cash return is calculated by subtracting real cash return estimates described later in the article. Estimates are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any portfolio that AQR currently manages.

Credit Indices

To estimate expected real returns for public credit indices, we first apply a haircut of 50% to both investment grade and high yield spreads to represent the combined effects of expected default losses (the main driver for HY), and downgrading bias and bad selling practices (the main drivers for IG).[5] We assume no change in the spread curve, say, through mean reversion. We add the expected real yield of a duration-matched Treasury, and rolldown from both Treasury and spread curves. Finally, we include corrections for convexity and variance drag.[6]

Exhibit 5 shows our updated estimates for U.S. credit indices and hard-currency emerging market sovereign debt. Higher Treasury yields and improved rolldown outweighed narrower spreads in 2024, while the HY-IG spread remained narrow.

Exhibit 5: Expected Real Returns for Credit Indices as of December 31, 2024

	A. Spread Return OAS * 0.5	B. Treasury Real Yield Y - I	C. Rolldown Return R_T+R_C	D. Convexity & Variance Con - Var	Expected Real Return A+B+C+D	*1yr Change*	Excess-of-Cash Return
U.S. Corp. IG	0.4%	2.2%	0.3%	0.2%	**3.1%**	*+0.4%*	1.4%
U.S. Corp. HY	1.4%	2.3%	0.2%	-0.5%	**3.5%**	*+0.5%*	1.8%
EM USD Sov.	1.3%	2.3%	0.3%	-0.0%	**3.8%**	*0.0%*	2.0%

Source: Bloomberg, AQR. Estimates as of December 31, 2024. OAS and duration data are for Bloomberg Barclays U.S. Corporate Investment Grade (IG), U.S. Corporate High Yield (HY) and Emerging USD Sovereign (EM USD Sov) Indices. Index durations are 7.0 years, 3.5 years and 7.1 years respectively. For EM debt we use US HY OAS rolldown due to data limitations. Excess-of-cash return is calculated by subtracting real cash return estimates described later in the article. Estimates are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any portfolio that AQR currently manages.

Commodities

Commodities do not have obvious yield measures, and we find no statistically significant predictability in medium-term returns (see the 2016 edition). Our estimate of 5- to 10-year expected return is therefore simply the long-run average return of an equal-weighted portfolio of commodity futures. This portfolio has earned about 3% geometric average excess return over cash since 1877, and a similar return if measured since 1951.[7] We add the U.S. real cash return to give an expected real return of 4.7%.

We do not have medium-term return estimates for individual commodities, but would expect them to deliver a substantially lower risk-adjusted return than a diversified basket over the long term. A gold investment, for example, has exhibited useful tail-hedging properties historically, but it forgoes the considerable diversification found within the broader asset class.[8]

[5] Consistent with Giesecke et al. (2011) and Ben Dor et al. (2021), who find that over the long term, the average credit risk premium is roughly half the spread. 'Bad selling' refers to the practice of selling bonds that no longer meet the rating or maturity criteria of the index.

[6] These terms, both related to volatility, are not as closely offsetting for broad indices as they are for single bonds, due to diversification effects. Briefly, the convexity term estimates the impact of non-linearities assuming yields will change, while the variance drag term estimates the impact of compounding effects assuming return volatility will be non-zero.

[7] For more details see the 2016 edition, Levine, Ooi, Richardson and Sasseville (2018), and the AQR data library.

[8] From January 1975 to December 2024, an investment in gold futures delivered around 1.4% p.a. compound real return, a little more than cash.

Alternative Risk Premia

It is difficult to apply a yield-based approach to dynamic strategies where holdings are constantly evolving. Below we state long-term assumptions for what we believe to be sustainable long-term premia, backed by a broad range of empirical evidence.[9]

Factor-Tilted Long-Only Portfolios

We believe a hypothetical value-tilted, diversified long-only equity portfolio that is carefully implemented and reasonably priced may be assumed to have an expected return 0.5% higher than the cap-weighted index, after fees, with 2-3% tracking error. For an integrated multi-factor strategy – which we assume to include balanced allocations to value, momentum and defensive themes – we assume an expected net active return of around 1% at a similar tracking error. Finally, we think a defensive equity portfolio may be assumed to have an expected return similar to that of the relevant cap-weighted index but may achieve this with lower volatility.[10] These are long-term estimates – we discuss tactical considerations below.

Long/Short Factor Premia Implemented Standalone or as "Portable Alpha"

Alternative risk premia strategies are typically implemented as a long/short market-neutral portfolio across multiple asset classes. They can be scaled to different risk levels, so we focus on expected Sharpe ratio (SR). The degree of diversification is critical. One theme applied in one asset class might have an expected SR of 0.2-0.3. For a diversified combination, we believe an expected SR of 0.7-0.8, net of trading costs and fees, can be feasible when multiple factor themes are applied in multiple asset classes. At a target volatility of 10%, such a hypothetical portfolio would have an expected return of 7-8% over cash.[11, 12] Long/short implementations are particularly interesting in the current environment for two reasons:

- **"Cash-plus" returns:** central bank began to cut interest rates in 2024, but rates are likely to remain substantially higher than in the previous decade. This directly benefits total returns for long/short liquid alternatives with large cash holdings – a fact often underappreciated by investors.[13]
- **"Portable alpha" implementations:** when combined with market beta, long/short strategies can be used as an alternative to traditional active management. During episodes of higher market concentration where most stocks have tiny index weights, the efficiency advantage of long/short strategies over long-only tilts is probably larger than normal.

Current Valuations

Aggregate valuations across multiple styles are near long-term averages. Among individual styles, the equity value style appeared extremely cheap in the early 2020s but spreads gradually normalized during 2023-24. They are still at healthy levels at the start of 2025, but no longer point to an exceptional tactical opportunity. Broad diversification across compensated factors, combined with modest tactical variation, may be the best approach for the years ahead.

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[9] See for example Ilmanen et al. (2021), "How do Factor Premia Vary Over Time? A Century of Evidence".

[10] Factor-tilted strategies exhibit many design variations. Our estimates are purely illustrative and do not represent any AQR product or strategy.

[11] Consistent with historical data, we assume low correlations between factors to produce our Sharpe ratio range for a diversified combination of long/short factors. As transaction costs depend on implementation and both transaction costs and fees vary with target volatility, our estimates are based on a transaction-cost-optimized strategy targeting 10% volatility with fees of 1 to 1.5%. Refer to the 2015 edition for discussion of factor premia assumptions. All assumptions are purely illustrative and do not represent any AQR product or strategy.

[12] We stress that this requires careful craftsmanship in portfolio construction as well as great efficiency in controlling trading, financing and shorting costs. Strategies that are less well-designed or poorly implemented may have much lower expected returns. See Israel, Jiang and Ross (2017), "Craftsmanship Alpha: An Application to Style Investing".

[13] For further analysis see Maloney (2024), "Honey, the Fed Shrunk the Equity Premium".

Private Assets

Illiquid assets are inherently harder to model than public markets, and data are less plentiful. Nevertheless, we attempt to apply our discounted-cashflow approach to the illiquid realm. For **private equity** we estimate an expected net-of-fee return for U.S. buyout funds. Each of our inputs is debatable, as data limitations necessitate lots of simplifying assumptions, and each input can substantially affect the final estimate. We estimate unlevered return using the DDM: $E(r) \approx y_U + g_U$, where y_U = unlevered payout yield and g_U = real earnings-per-share growth rate. Then we apply leverage and the cost of debt, and finally we add expected multiple expansion and subtract fees (see **Exhibit 6**).[14]

Our yield-based real return estimate fell sharply when the cost of debt increased in 2022-23. During 2024, cost of debt remained high, valuations rose and leverage fell, leaving our estimate at just 1% net of fees. An alternative approach, which applies size and leverage adjustments to a public proxy, assuming zero net alpha, generates a higher estimate of 4.6%.[15] Taking an average of the two approaches gives a final estimate of **2.8%,** more than 1% *lower* than our U.S. large cap estimate.

Exhibit 6: Expected Real Returns for U.S. Private Equity as of September 30, 2024

Unlevered			Leverage		Levered							
y_U	g_U	$r_U = y_U + g_U$	D	k_D	$r_L = r_U + D*(r_U - k_D)$	m	$r_G = r_L + m$	f	$r_N = r_G - f$	r_T	avg (r_N, r_T)	
Income Yield	Real Growth	Real Return	Debt to Equity	Real Cost of Debt	Levered Real Return	Mult. Expansion	Gross Real ER	Fees	Net Exp. Real Return	Top-Down Est.	Combo Real Return	*1yr Change*
1.7%	3.0%	4.7%	52%	4.6%	4.7%	0.3%	5.0%	4.0%	1.0%	4.6%	**2.8%**	*-0.3%*

Source: AQR, Pitchbook, Bloomberg, CEM Benchmarking. Estimates as of September 30, 2024. Real cost of debt is expected real inter-bank rate plus a spread based on bank loan data, averaged over 12 months. Strictly speaking, our inputs are log returns and should be converted to simple returns before leverage is applied, then converted back to log returns, but we omit this minor adjustment. Estimates are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any AQR product or strategy.

We estimate expected returns for unlevered U.S. direct **real estate** as represented by the NCREIF indices. We caveat that returns for individual real estate funds can vary vastly from the industry average (this is also true of PE). As with our DDM-based approach for equities, we sum payout yield and expected long-term growth rate.[16] **Exhibit 7** shows a 0.3% rise in our expected real return for unlevered real estate to 3.2%.

Exhibit 7: Expected Real Returns for U.S. Private Real Estate as of September 30, 2024

NOI	C ≈ NOI / 3	CF ≈ NOI - C	g	ER = CF + g	
NOI Yield	Capital Expenditure	Cashflow Yield	Real Growth	Unlevered Real Return	*1yr Change*
4.8%	1.6%	3.2%	0.0%	**3.2%**	*+0.3%*

Source: AQR, NCREIF Webinar Q3 2023. Estimates as of September 30, 2024. Estimates are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any AQR product or strategy.

[14] See Ilmanen, Chandra and McQuinn (2020) for a detailed discussion of the original version of this framework and other ways to assess expected PE returns. This year we reduce our all-in fee estimate from 5% to 4% to reflect lower expected carried interest. Strictly speaking, our estimate applies to the current vintage rather than the entire PE market.

[15] See the 2019 edition for details of this alternative method.

[16] See Ilmanen, Chandra and McQuinn (2019) for full details of our methodology and assumptions.

Private credit has been a hot asset class in recent years, but many allocators remain unsure of how to estimate its expected return and risk. We approach this question by using public credit as an anchor, and then asking how private credit might differ (similar to our approach for private equity, where we consider differences versus public equity).

Data for empirical analysis are limited, but there is little evidence of alpha or an illiquidity premium over listed credit at the industry level. We assume that higher fees and investors' preference for smooth returns fully offset any premium on average. We therefore model private credit as floating-rate high yield listed credit, with a small adjustment for industry-average leverage. Industry-wide private debt modification rates are similar to average default rates for single-B listed credit, hence the choice of a high yield proxy. See the 2024 edition for further discussion.

Our latest real return estimate of 3.1% reflects narrowing spreads and lower cash rates in 2024.

Exhibit 8: Expected Real Returns for U.S. Private Credit as of December 31, 2024

C=OAS*0.5 +roll	L	C * L	R	C*L - V + R	
HY Credit Excess	Leverage Multiplier	Levered Excess Ret	Real Cash Return	Expected GM Real Return	*1yr Change*
1.6%	1.2	1.9%	1.7%	**3.1%**	*-0.5%*

Source: Bloomberg, AQR. Public proxy is based on Bloomberg Barclays U.S. Corporate High Yield (HY) Index in excess of duration-matched U.S. Treasury. Leverage estimate from Block et al. (2023). Cambridge Associates Private Credit modification rate from 2002 to 2017 was 10% compared to 11% default rate for Moody's single-B listed credit. V is a variance drag term. All assumptions are purely illustrative and do not represent any AQR product or strategy. Methodology and return assumptions are subject to change and are as of December 31, 2024.

Cash

Our cash forecasts are a simple average of three inputs: current short rates, 10-year bond yields and survey-based forecasts of average short rates. The first two inputs reflect pure risk premium and pure expectations hypotheses, respectively, and the third input gives more direct evidence of market expectations for rate changes.

Exhibit 9 shows that cash forecasts stabilized in 2024 after two years of increases, now sitting at around 1.7% in the U.S. and 0.7% in the eurozone. These positive real cash returns imply slimmer risk premia for some other asset classes, notably equities and private assets.

Exhibit 9: Expected Local Real Returns for Cash as of December 31, 2024

	S	L	E	I	avg(S,L,E) - I	
	3-Month Yield	10-Year Yield	Next 10Y Avg. Forecast Short Rate	10Y Forecast Inflation	Expected Real Cash Return	*1yr Change*
U.S.	4.3%	4.6%	3.2%	2.3%	**1.7%**	*-0.2%*
Eurozone	2.6%	2.9%	2.4%	2.0%	**0.7%**	*-0.1%*
U.K.	4.8%	4.6%	3.2%	2.1%	**2.1%**	*+0.3%*
Japan	0.2%	1.1%	1.0%	1.7%	**-0.9%**	*+0.4%*
Australia	4.3%	4.4%	3.2%	2.5%	**1.5%**	*+0.2%*

Source: Bloomberg, Consensus Economics and AQR. Estimates as of December 31, 2024. Eurozone is cap-weighted average of Germany, France, Italy, Netherlands and Spain. Estimates are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any portfolio that AQR currently manages.

Special Topic: The Growth Debate

The Price of Exuberance

U.S. corporate earnings have seen impressive growth during recent decades. During the 30 years to June 2024, real EPS growth was above 4% p.a. in the U.S., compared to around 2–3% for other developed markets. Ten years ago, in the 2015 edition of this report, we assumed just 1.5% real EPS growth for the next 10 years, but the U.S. delivered around 4% during that period too.[17]

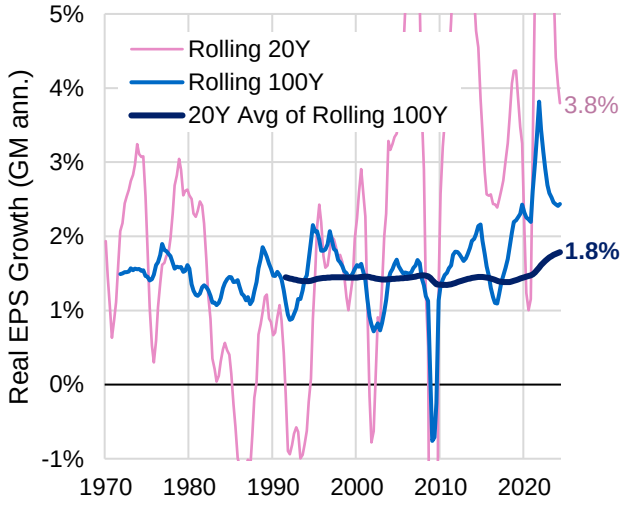
However, despite these impressive fundamentals, the U.S. market looks expensive by several popular valuation metrics. Its Shiller CAPE of 38 (the current price compared to those buoyant 10-year earnings) is at the 98th percentile since 1900, exceeded only twice before – during the Tech Bubble frenzy, and briefly in late 2021 with interest rates at zero. Some valuation measures appear less extreme, but almost all are elevated. Importantly, U.S. return outperformance over the past decade – above our 2015 forecasts and above other markets – was actually driven by expanding multiples more than it was by stronger growth. Why have investors pushed U.S. equity prices so high even compared to strong fundamentals? There may be several drivers,[18] but the biggest one seems clear: investors expect strong U.S. earnings growth to continue or even accelerate, and they want a piece of it.

Estimating Future Growth

For allocators assessing medium-term prospects for equity markets, what is a reasonable growth assumption? We start with very long-term historical averages. **Exhibit 10** shows the rolling 20-year compound real EPS growth rate in pink – 20 years may seem a long period to some investors, but the series is very volatile. We also show the rolling 100-year growth rate, and we apply an extra 20-year smoothing to mitigate the (substantial) impact of start- and endpoints. This metric hovered around 1.5% for decades, and this was our previous assumption for long-term growth. But recent strong data has lifted it to 1.8%, and this year we have revised our assumption accordingly. Now, some of the recent growth tailwinds may not be repeated. Smolyansky (2023) estimates that one-off reductions in corporate tax rates and interest rates explain nearly half of U.S. earnings growth from 1989 to 2019. Some tailwinds may continue (various arguments for U.S. exceptionalism, plus the prevalence of buybacks which reduce the share count), while others may be just getting started (such as the impact of AI or the dominance of higher-growth tech conglomerates), but it's unclear how long they will last. On balance, we believe a long-term "equilibrium" assumption should be around 2%, rather than the past 30-year experience of around 4%.

Exhibit 10: How Recent Strong U.S. EPS Growth Raised Our Long-Term Estimate

January 1871 – September 2024



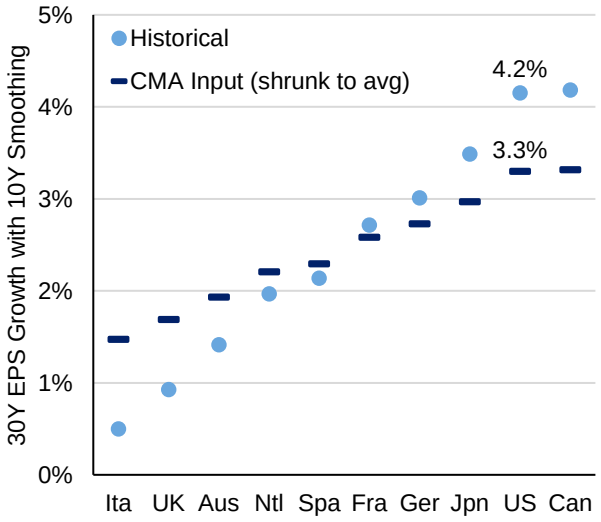
Source: Robert Shiller data library and AQR. Based on trailing 1-year earnings at quarterly frequency, adjusted for CPI inflation.

[17] Different data sources given slightly different numbers, but the main pattern of U.S. outperformance is clear.

[18] Other candidates include the rise of passive investors insensitive to both relative and aggregate market valuations; the lingering after-effects of the long period of ultra-low interest rates; and the supply/demand implications of a general reduction in share issuance in favor of debt financing and/or private ownership.

For cross-country historical comparisons, we are limited to shorter periods. **Exhibit 11** shows 30-year EPS growth rates (10-year smoothed) for 10 countries. In our CMA framework, we shrink these halfway towards a global average to reflect uncertainty around whether such cross-country patterns will persist. Effectively we assume half the historical country differences are sustainable, and half are sample-specific. This leaves the U.S. with about a 1% assumed structural advantage over the global ex-U.S. average, from this input.

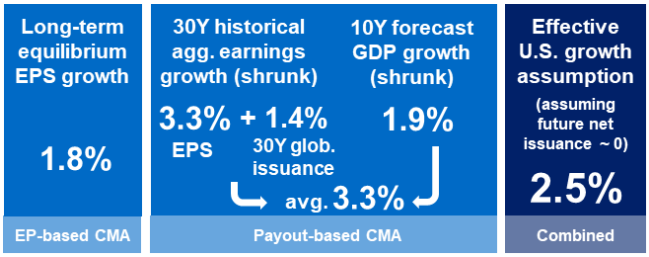
Exhibit 11: 30-Year EPS Growth by Country
September 1984 – September 2024



Source: Bloomberg, Reuters and AQR. Growth rates are shrunk towards simple average of 10 largest developed markets.

What about forward-looking measures? Analyst earnings forecasts over multi-year horizons tend to be both upward-biased and highly pro-cyclic. Economists' GDP growth forecasts are a readily available alternative. Now, GDP is only very loosely related to corporate earnings, and GDP growth has been much slower than earnings growth in most developed markets in recent decades (China has seen the opposite pattern). But GDP forecasts do give a useful high-level indication of growth prospects in each country, and the generally lower levels may act as a counterbalance to 30-year earnings growth numbers that may reflect one-off historical tailwinds.[19]

Our U.S. growth assumption inputs are summarized below. Our use of different sources and methods make it a slightly untidy methodology, but we hope the combination adds some robustness.



Market's Implied Growth Expectations

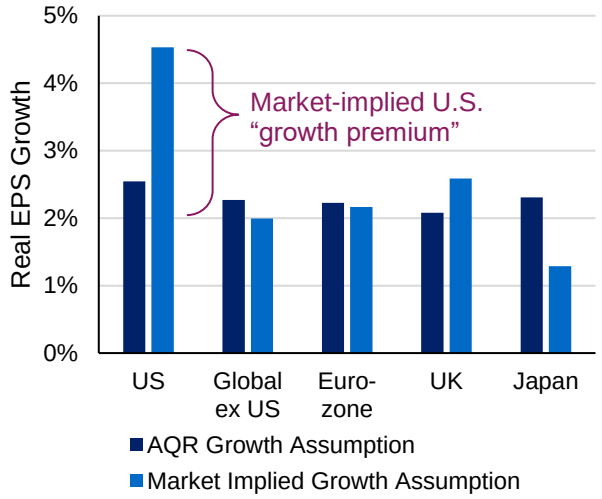
Our combined U.S. real growth assumption of around 2.5% implies a compressed equity risk premium at the start of 2025, with an excess-of-cash return forecast of just 2.5% (see Exhibit 3 earlier). Now, to generate a reasonable long-term Sharpe ratio of 0.3 at around 15% volatility, the equity market would need to earn 4–5% over cash. If we assume no change in valuation over the next 10 years (which some may consider optimistic), this would require real EPS growth of 2% higher than our assumption – in other words, strong growth of around 4.5% p.a. **Exhibit 12** compares our growth assumptions for the next decade with those that would be required for equities to deliver a reasonable premium over cash in each country.[20] While we assume a modest U.S. growth advantage of around 0.3–0.5%, the market is effectively pricing a much larger U.S. advantage of around 2–3%.

Some readers may consider our growth assumptions too conservative. But we believe a good CMA framework should resist the strongly pro-cyclic tendency of the market's growth expectations, and instead make a well-anchored assumption that acknowledges the wide range of possible outcomes.

[19] We assume GDP to be analogous to aggregate earnings, and GDP-per-capita to earnings-per-share. Going forward, per-share and aggregate earnings may be more similar as buybacks offset issuance.

[20] There are other ways to estimate the market's implied growth assumption. One could take a simple real yield measure for each country and calculate the growth rates required to make an equal set of real returns. We choose to anchor to excess-of-cash returns because of the different real cash rates available across countries. For each country we estimate the required excess return from a long-term Sharpe ratio assumption adjusted for breadth together with historical volatility.

Exhibit 12: Earnings Growth Assumptions by Country as of December 2024



Source: Bloomberg, Reuters, Consensus Economics and AQR. AQR growth assumption is simple average of long-term equilibrium growth (1.8%) and country-specific estimate as described above. Market implied growth assumption adds or subtracts enough growth to attain our estimate of required excess-of-cash return for each country (approx. 4-4.5%).

Final Thoughts

Investors' over-extrapolation of the relative growth prospects of individual companies is a key driver of the long-term value premium, and it is likely the same bias prevails in cross-country growth comparisons and in cyclical time variation in growth expectations. For allocators, there is a balance to be struck: the structural advantages of the U.S. and the growth potential of new technologies should be reflected in capital market assumptions; the market's tendencies toward over-extrapolation and over-exuberance (looming large at the start of 2025) should not.

The long-term benefits of a diversified portfolio do not accrue steadily, but rather come in waves. Unfortunately, many investors give up on diversification – across regions and asset classes – just as the next wave is about to break.[21]

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[21] For a lighter take on how the next decade might play out, see Cliff's Perspective, January 2025.

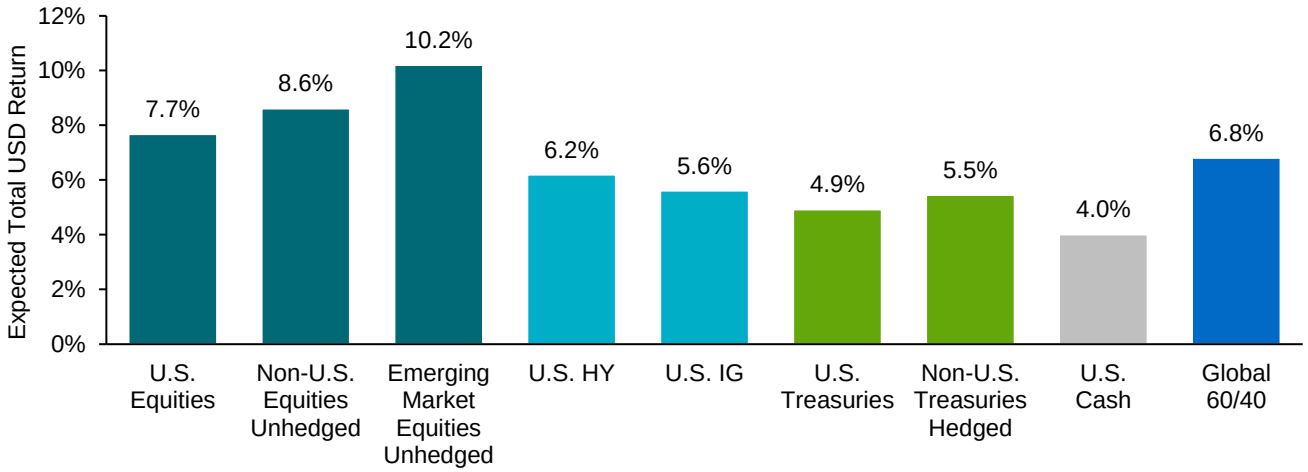
Appendix

Translating Local Real Returns to Expected Total Returns for a Given Base Currency

In the rest of this paper we report local real and excess-of-cash returns. In Exhibit A1 we translate these into nominal arithmetic returns by adding local expected inflation and variance drag terms. We also quote unhedged U.S dollar estimates for non-U.S. equities, in line with common investing practice. Currency return assumptions are based on expected inflation differentials. Expected returns for other base currencies are available on request.

Exhibit A1: Expected Total Nominal Arithmetic Returns for a U.S. Dollar Investor

As of December 31, 2024



Source: AQR. Estimates as of December 31, 2024 are USD-denominated total nominal annual arithmetic rates of return. "Non-U.S. developed equities" is cap-weighted average of Euro-5, Japan, U.K., Australia and Canada, unhedged. U.S. and Non-U.S. Treasuries are respective Bloomberg Barclays indices rather than single bonds. Global 60/40 is a 60%/40% weighted average of the developed equities listed above and developed government bonds listed above, respectively. Estimates are for illustrative purposes only, are not a guarantee of performance and are subject to change. Not representative of any portfolio that AQR currently manages.

Sources and Methodology for Long-Term Historical Expected Returns

Sources for historical equity and bond expected returns are AQR, Robert Shiller's data library, Kozicki-Tinsley (2006), Federal Reserve Bank of Philadelphia, Blue Chip Economic Indicators, Consensus Economics and Morningstar. Prior to 1926, stocks are represented by a reconstruction of the S&P 500 available on Robert Shiller's website which uses dividends and earnings data from Cowles and associates, interpolated from annual data. After that, stocks are the S&P 500. Bonds are represented by long-dated Treasuries. The equity yield is a 50/50 mix of two measures: 50% Shiller E/P * 1.075 and 50% Dividend/Price + 1.5%. Scalars are used to account for long term real Earnings Per Share (EPS) Growth. Bond yield is 10-year real Treasury yield minus 10-year inflation forecast as in Expected Returns (Ilmanen, 2011), with no rolldown added.

Methodology for Forecast Error Analysis (Exhibit 1)

Not only are the return forecasts uncertain, but also any measures of forecast uncertainty are debatable. Forecasting requires humility at many levels. We first produce historical time series of yield-based estimates for U.S. equities and U.S. Treasuries using the method described in the previous paragraph (analysis starts in 1900, but we use data from 1870s onwards). We test their predictive power using quarterly overlapping 10-year periods since 1900 and measure the distribution of errors. See the 2018 edition for more details. Error ranges in Exhibit 1 are based on interquartile ranges of these distributions, adjusted for current volatility estimates.

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The MSCI USA Small Cap Index is designed to measure the performance of the small cap segment of the US equity market. With 1,730 constituents, the index represents approximately 14% of the free float-adjusted market capitalization in the US.

The FTSE 100 Index is an index composed of the 100 largest companies by market capitalization listed on the London Stock Exchange.

The TOPIX Index is a free-float adjusted market capitalization-weighted index that is calculated based on all the domestic common stocks listed on the TSE First Section.

The MSCI Emerging Markets Index is a free float-adjusted market capitalization index that is designed to measure equity market performance of emerging markets.

The Bloomberg US Aggregate Bond Index is a broad-based flagship benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market.

The Bloomberg Global Aggregate Index is a flagship measure of global investment grade debt from twenty-eight local currency markets.

The Bloomberg Barclays US Corporate Bond Index measures the USD-denominated, investment-grade, fixed-rate, taxable corporate bond market.

The Bloomberg Barclays US Corporate High Yield Index measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch and S&P is Ba1/BB+/BB+ or below.

The Bloomberg Barclays Emerging Markets Hard Currency (USD) Sovereign Index is an Emerging Markets debt benchmark that includes USD-denominated debt from sovereign EM issuers.

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