Global Investment Research | Fixed Income

What a carry-on: starting yields as a valuation tool for sovereign bonds

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Executive Summary

- Using FTSE Russell data since 2000, we seek to answer the question whether initial valuations of US Treasuries are positively correlated with subsequent returns, over different investment horizons?
- This is a key issue for a range of fixed income investors, both for outright returns and asset/liability matching.
- This paper is the third in the FTSE Russell Global Investment Research "Valuation Matters" series[1] [2] and like US equities and high yield credit, we find initial valuations are indeed correlated with future returns in US Treasuries.
- Peak correlation occurs where the maturity of the US Treasury index is closest to the investment horizon, i.e., 2 years for the 1-3 year Treasury index, 7-10 years for the 7-10 year Treasury index, and at 20 years for the 20 years + index.
- Wide yield ranges between 2000 and 2026 mean price and duration effects on returns vary considerably, but even for long bonds mean reversion in yields causes price effects to average out in the longer term, leaving starting yields and roll-down as key drivers of returns.
- We also assess the relationship between yields and returns in different yield regimes, and the impact of changes in yields, versus initial yield levels, on returns. Again, we find starting yields are the key variable, and that returns can be higher, even in rising yield regimes, due to carry and roll-down[3] effects exceeding price effects (though this depends on a positive yield curve gradient).
- We recognise auto-correlation in returns time series is evident, but this does not mean the impact of starting yields, or carry, in driving returns is not still significant.
- There are good economic reasons to expect autocorrelation in both govt bond yields and returns anyway, from central bank forward guidance on rates, to protracted business cycles, to relatively stable inflation expectations, and to predictable carry and roll-down on the yield curve.

[1] See Valuation matters: US high yield and US equities | LSEG, May 2023.
[2] And also Do valuations correlate to long-term returns? Examining US equities through various size and style indices | LSEG, January 2025.
[3] Roll-down is defined as the gain a fixed coupon bond, or portfolio, makes as its yield falls due to shortening in maturity and sliding down a normal, upward sloping yield curve, ceteris paribus.

Contents

Introduction – why valuations are important in investment analysis

Valuations are a fundamental foundation of long-term investment analysis, being used both to gauge the attractiveness of different asset classes and predict potential future returns. In previous papers, we looked at the issue of whether initial starting valuations in risky assets, like US equities and credit, were a good guide to future returns and found valuations do indeed have a strong predictive relationship with future returns of risky assets like US equities and US high yield credit.

We now look at risk-free assets like US Treasuries, using FTSE Russell index data, to see if the same concept holds, namely – (1) do starting yields help predict subsequent returns, across different investment horizons and maturities, and to what extent? (2) We also assess whether the relationship between starting yields and future returns varies in different interest rate and yield regimes?

The academic literature tends to confirm higher starting yields drive higher returns

Dating back to the paper by Fama and Bliss[4] [5] [6] (1987), the academic literature generally supports the notion higher starting yields drive higher subsequent returns. Over the longer term, this is unsurprising since bond returns are driven by –

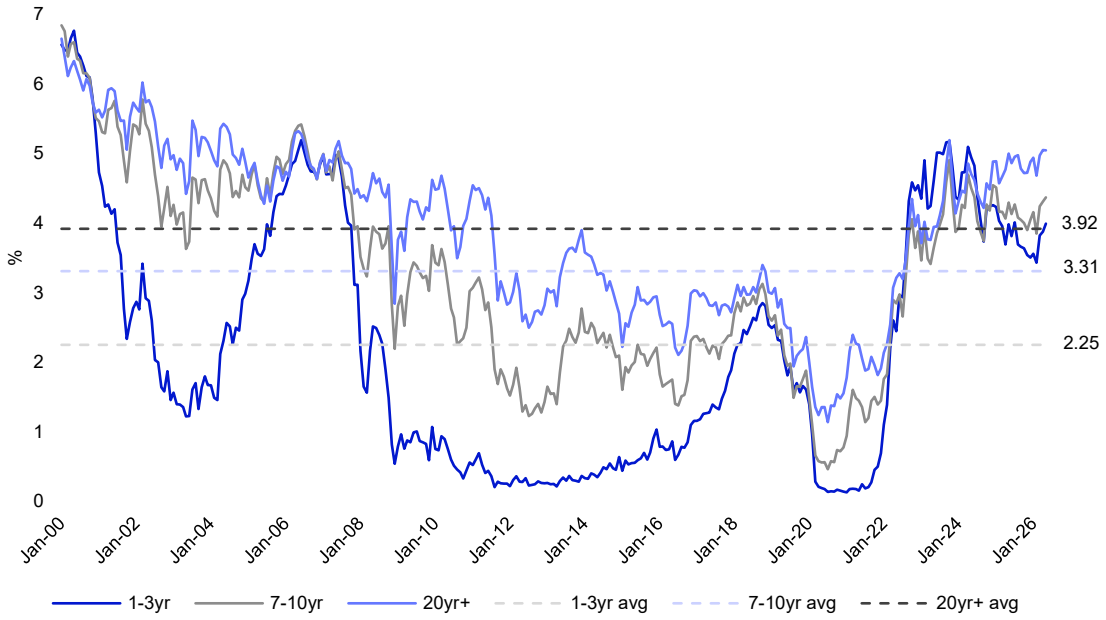
Returns = Starting yield + roll-down curve + price effect (dP/dy)[7]

In a trivial sense, we know redemption yields capture returns to maturity, and that higher starting yields will mean higher returns at redemption, and vice versa, for a single bond. But returns can vary considerably during the lifespan of a bond, as term premia and rate expectations change.

But by using index data, we avoid the pull-to-par effect near maturity for a single bond, and can analyse returns and correlations for a constant maturity index or portfolio, since bonds will exit the index as they fall below the minimum maturity in the index. Yield regimes varied considerably since 2000, as Chart 1 shows, with yields varying from less than 1% in the Covid period to above 4% now in the 7-10 year Treasury index. Mean reversion of yields is also evident in the Chart, which is another important driver of returns, since low yields will tend to rise over time, and high yields will tend to fall.

[4] The Information in Long-Maturity Forward Rates, Eugene F. Fama and Robert R. Bliss, The American Economic Review (1987).
[5] Yield spreads and interest rate movements: a bird's eye view, John Y. Campbell and Robert J. Shiller, Review of Economic Studies, (1991).
[6] For Constant-Duration or Constant-Maturity Bond Portfolios, Initial Yield Forecasts Return Best near Twice Duration, University of Utah, Gabriel A Lozada (2015).
[7] dP/dy is a bond's price sensitivity to yield: duration is the normalised (%, sign-adjusted) version of that sensitivity.

Chart 1: US Treasury yields 2000 - 2026



Source: FTSE Russell/LSEG. Data as of May 31, 2026. Monthly data from January 2000 to May 2026.

Mean reversion of yields suggests impact of starting yields increases over time…

In addition, the mean reversion of yields, and effect of carry on returns, suggest the correlation of returns with starting yields may rise over longer term horizons and be lower in the short term, when returns are driven more by rate expectations and term premia. To assess this, we calculate correlations between various starting yield levels, for different maturity buckets in the FTSE Russell US Treasury index, and forward-looking returns over multiple investment horizons ranging from 1 to 20 years.

The analysis is conducted using monthly data from January 2000 through May 2026, and the results are shown in Table 1. Total returns are used for each maturity bucket, capturing both roll-down and reinvestment effects. Statistically, we accept that our returns time series show auto-correlation, because of overlapping data windows. But raw statistical auto-correlation in the returns time series does not mean the impact of starting yields, or carry, in driving returns is not still significant. There are good economic reasons to expect autocorrelation in both government bond yields and returns anyway, from central bank forward guidance on rates, to protracted business cycles, to relatively stable inflation expectations, to predictable carry and roll-down on the yield curve. All these factors may help drive high correlation between starting yields and total returns, anyway, and particularly over investment horizons close to the maturity of the bond indices, as Table 1 shows.

Table 1: Correlations of yields to forward (Fwd) returns for 1-3 years, 7-10 years and 20 years+ indices

Yield\horizon	1Y Fwd	2Y Fwd	3Y Fwd	5Y Fwd	7Y Fwd	10Y Fwd	20Y Fwd
1-3Y Yield	0.84	**0.95**	**0.94**	0.79	0.78	0.78	0.94
7-10Y Yield	0.53	0.67	0.74	0.79	0.83	**0.92**	0.90
20Y+ Yield	0.40	0.55	0.65	0.74	0.73	0.83	**0.89**

Source: FTSE Russell/LSEG. Data as of May 31, 2026. Monthly data from January 2000 to May 2026.

…this is verified in the correlation of forward returns to starting yields

Table 1 shows that firstly, correlations are greater when time to maturity is broadly aligned with investment horizons. Thus the correlation of 1-3 year index starting yields is highest to 2 and 3 year forward returns, and the highest correlations of 7-10 year index starting yields are with 7Y and 10Y forward yields (even with no pull-to-par effect in a constant maturity index). This is because peak correlation to starting yields occurs when the starting yields on the original bonds in the index and carry dominate returns, i.e., at the 2-3 year horizon for the 1-3 year index. As the index composition changes and the index passes the original investment horizon of 1-3 years, changes in yields become more important, and starting yields become less correlated with returns in the shorter maturity indices, though the correlation still remains significant, even on longer investment horizons.

Duration effects in longer indices tend to diminish over time as yields mean revert

Secondly, the long 20 year+ index shows lower correlation with starting yields in the early return years, since changes in yields and term premia may be more powerful in driving returns than carry, and duration effects are clearly powerful in these longer dated indices. But over longer horizons, mean reversion of yields is likely to cause the duration effect to average out, while the ongoing carry from starting yields continues and becomes more dominant as the index approaches the 20 year horizon. These longer investment horizons are also likely to capture at least one full interest rate cycle, as Chart 1 shows.

To assess these relationships further, we focus on maturity horizons showing the strongest relationships between starting yields and subsequent returns in Table 1, i.e.,(1) 1-3 year maturities with 2- and 3-year forward returns, (2) 7-10 year maturities with 10-year forward returns, and (3) 20+ year maturities with 20-year forward returns. For each pair, we first regress forward returns on starting yields, both to assess the underlying sensitivity of returns to yields, shown in the Beta, as well as the correlation of returns. Then, for each pair, we evaluate the relationship between starting yields and forward realised returns using a quintile-based sorting approach.

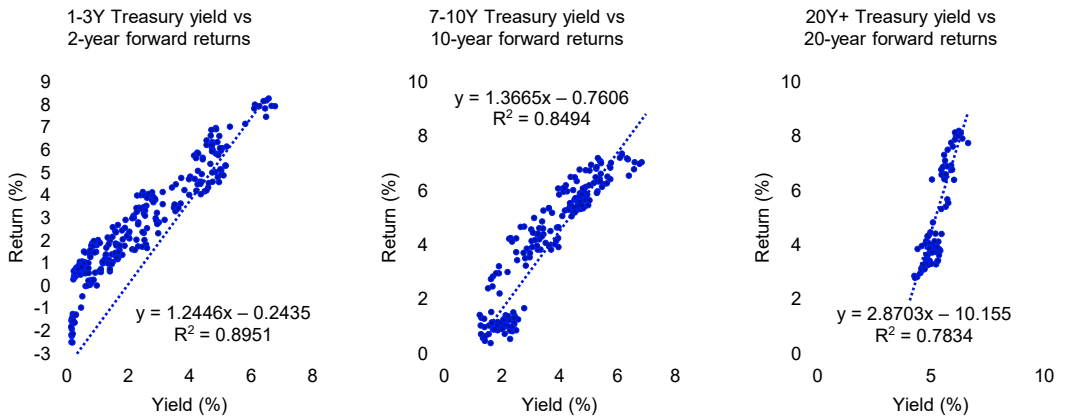
Yield Beta of returns highest in longest maturities but dampened by carry effect

Scatter plots and regressions are shown in Chart 2 for the 3 maturity buckets. As would be expected, the Beta of returns relative to yields is lowest for the 1-3 year index, due to lower duration and the strong influence of carry, and highest for the 20 year + index, helped by higher duration and convexity. But the increase in the Beta for the 7-10 year index for a 7 to 10 year investment horizon is quite modest versus the 1-3 year index (1.35 versus 1.25). This is because income, or carry effects are still powerful in 7-10 year bonds and the investment horizon is long enough for yields to mean revert, reducing the impact of changes in yields, and dampening the overall Beta.

Realised returns depend on carry and curve movements as well as duration/price effects

More generally, the Beta shown in the regression of empirical returns on yields, is not mechanically equal to the duration of the index, as empirical returns also depend on carry/roll-down and yield curve movements (see equation above), so duration, or the price sensitivity of the index alone, will not define returns. The long end still shows a much higher Beta of 2.9, however, partly reflecting the convexity of US Treasuries, (bonds gaining more in price when yields fall, than they lose in price when yields increase), but also changes in term premia and inflation regimes over a 20 year investment horizon. Re-investment risk is also much lower in long bonds, than short bonds, so starting yields are a strong guide to forward returns over longer periods, since investors effectively lock in the yield on the 20 year+ index at the start.

Chart 2. Scatter plot of 1-3 year, 7-10 year and 20+ year index returns versus yields



Source: FTSE Russell/LSEG. Data as of May 31, 2026. Monthly data from January 2000 to May 2026.

Table 2: Modified duration of selected FTSE US Treasury indices, 2000 - 2026

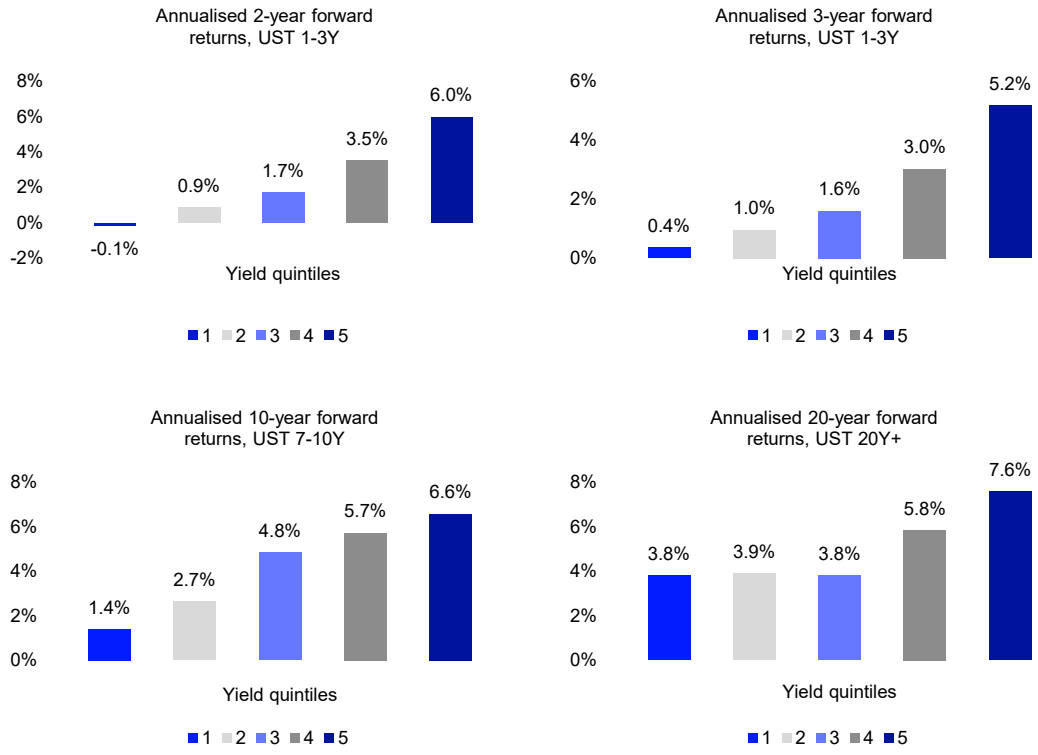
	1-3 year Treasury index	7-10 year Treasury index	20 year+ Treasury index
Modified duration (mean 2000 - 2026)	1.81	7.28	15.93

Source: FTSE Russell/LSEG. Data as of May 31, 2026. Monthly data from January 2000 to May 2026.

Higher starting yields drive higher forward returns for short-dated bonds…

Extending the analysis and using the 1-3 year maturity bucket and 2-year forward returns as an example, we first compute rolling 2-year forward returns on a monthly basis from January 2000 to May 2024 and annualise these returns. We then sort 1-3 year yield observations during the same period of time, i.e. January 2000 to May 2024, into quintiles (quintile 1=the lowest yields, quintile 5=the highest yields). Finally, we calculate the average annualised return within each yield quintile. Chart 3 shows that periods with higher starting yields (Quintile 5) are associated with the highest average subsequent returns, while periods with lower starting yields (Quintile 1) deliver the lowest returns. This pattern is consistent with the earlier findings and quite intuitive.

Chart 3: US Treasuries average forward returns by quintiles, TR, annualised

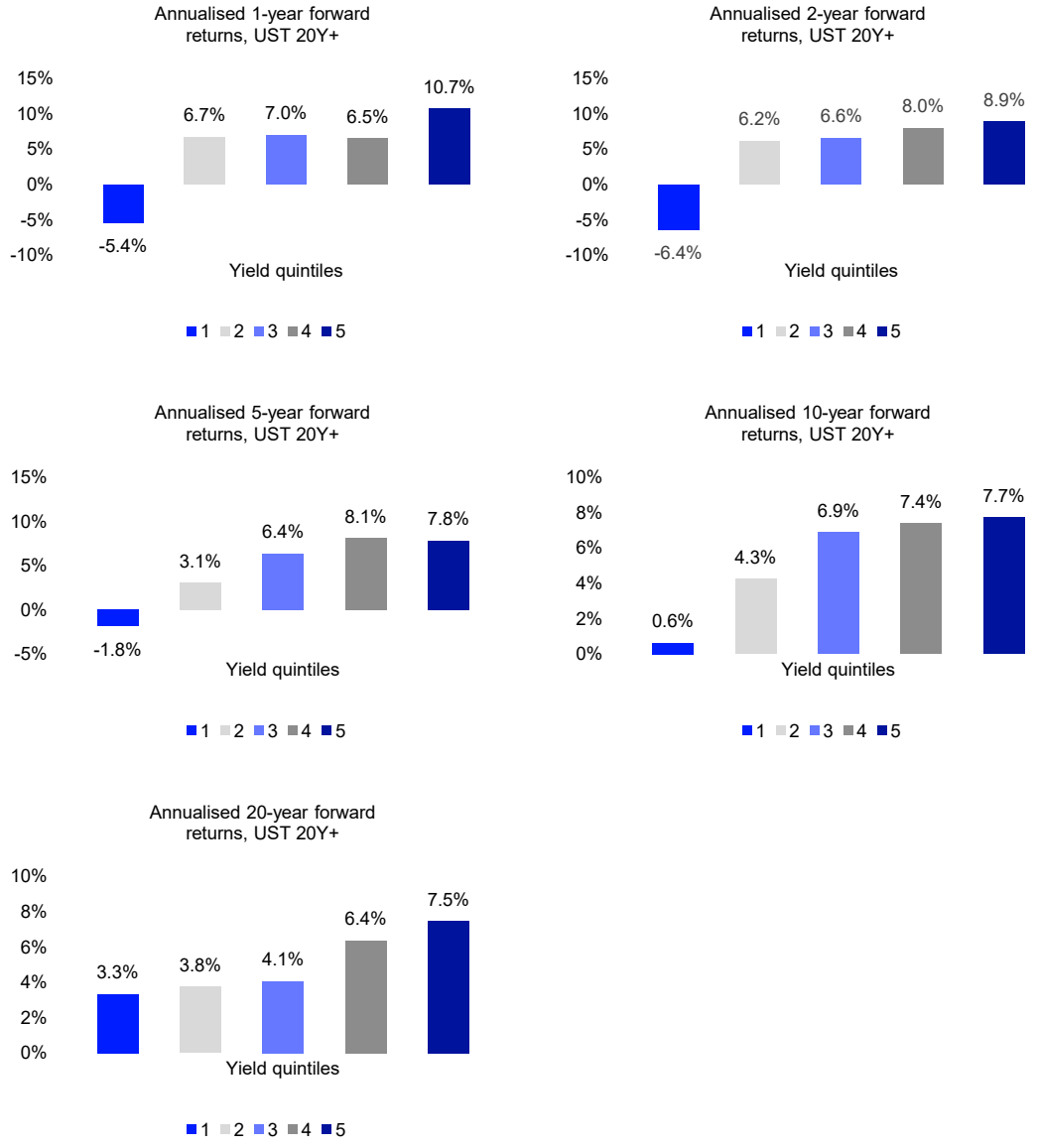


Source: FTSE Russell/LSEG. Data as of May 31, 2026. Monthly data from January 2000 to May 2026. The latest two-year forward return is calculated from May 2024 to May 2026.

….for long bonds, duration and price effects more significant in early years

Chart 4 focuses on longer-duration bonds, in the 20 year+ maturity bucket, with returns over various investment horizons, from 1-year to 20-year. Chart 4 shows shorter-term returns of longer-duration bonds are squeezed by lower starting yields, particularly when yields are low and on a rising trend. This is because duration effects can dominate coupon (or carry effect) in longer-duration bond returns in the early years. For the starting yields in Quintile 1, total returns only catch up with other groups when investment horizons extend to 20 years, which matches the maturity tenor. The negative returns for yield Quintile 1 over 1Y, 2Y, and 5Y, could largely be explained by rising yield regimes, given their low starting levels, as discussed in later sections (see below).

Chart 4: US Treasuries 20Y+ average forward returns by quintiles, TR, annualised



Source: FTSE Russell/LSEG. Data as of May 31, 2026. Monthly data from January 2000 to May 2026.

Does the relationship between yields and future returns vary in different yield regimes?

While the prior analysis focuses on starting yields and future returns, we extend the framework to incorporate the broader macro environment, particularly monetary policy and interest rate dynamics. We proxy these effects using yield changes over the subsequent 12-month period. Importantly, yield movements over this horizon serve as a practical proxy for monetary policy, as policy shifts are typically gradual and typically signalled in advance through central bank guidance.

We identify yield change regimes according to whether yields rise or fall…

While not fully predictable, changes in yields over the next 12 months are a useful indicator for assessing future bond returns. In this context, we examine the extent to which starting yields and yield change regimes jointly predict subsequent bond returns across different investment horizons and maturities. We classify monthly observations into regimes defined jointly by starting yield levels (yield percentiles) and subsequent 12-month changes in yields, as shown in Table 3. We then calculate the average forward returns for each regime.

Table 3: Yield regimes, based on starting yield and change over subsequent 12 months (M)

	Starting yield	Yield quintile	Yield change (12M)
Regime 1	High	5 and 4	Falling
Regime 2	High	5 and 4	Rising
Regime 3	Mid-range	3	Falling
Regime 4	Mid-range	3	Rising
Regime 5	Low	2 and 1	Falling
Regime 6	Low	2 and 1	Rising

…but forward returns still mainly driven by starting yields, whether yields rise or fall

Having identified the different yield regimes, Table 4 shows forward returns for all maturity buckets over different investment horizons. The results confirm returns are mainly driven by starting yield levels rather than yield direction, with high-yield environments delivering stronger returns, whether subsequent yields fall or increase. This is the case for all index returns particularly when bond index maturities match with the investment horizon, from short to longer terms.

Only on very short investment horizons do changes in yields dominate returns

The only investment horizon in which yield changes, as opposed to starting yield levels, have greater impact is the very short, 1 year horizon, and particularly for longer dated bonds, because of the extra duration effect, so the 20year + index bucket shows substantial differences between rising and falling yield regimes for this period. Also note that the difference in returns is greatest in the low yield regime over one year (22.8%!), since the duration effect on price is greater in a low yield regime, and reinforced by the convexity in long bonds. But these differences fall sharply over longer investment horizons as the duration effect averages out, and the starting yields investors have locked in become increasingly important for long bonds, given the low re-investment risk.

Returns show carry and roll-down may exceed negative price effect of rising yields

Another important result, which is circled in Table 4, is that the combined effect of carry, and positive roll-down on returns, from an upward-sloped yield curve (as bonds shorten in maturity), may exceed the negative price impact on bond returns in a rising yield regime. This is often evident in shorter bonds, where less duration means the impact of rising yields on price is modest anyway. Constant maturity indices will smooth the roll-down effect, as the index is re-balanced as bonds shorten and eventually leave the index, but this crystallises bond gains. Note however, that this result may reverse when yield curves invert, and have negative roll-down, when it becomes more difficult for rising yield regimes to outperform.

We also note that the 20 year forward returns sample period is clearly the shortest time series – from 2000 to 2006. It does not, therefore, capture the sharp decline in yields that occurred in 2008-10 during, and after the GFC, and again after Covid in 2020. This may explain why returns are lower overall compared with shorter investment horizons, as Table 4 shows.

Table 4: Annualised average forward returns in different yield regimes

Maturity-horizon pair	Regime 1	Regime 2	Regime 3	Regime 4	Regime 5	Regime 6
	High-falling	High-rising	Mid-falling	Mid-rising	Low-falling	Low-rising
1-3Y / 1Y forward	6.0%	2.3%	3.6%	0.9%	1.4%	0.0%
1-3Y / 5Y forward	2.8%	3.7%	1.5%	2.4%	0.9%	1.2%
1-3Y / 10Y forward	2.8%	2.5%	1.6%	2.4%	1.2%	1.1%
1-3Y / 20Y forward	2.6%	2.1%	2.1%	2.0%	1.9%	1.8%
7-10Y / 1Y forward	9.6%	1.9%	10.2%	-1.2%	7.7%	-3.6%
7-10Y / 5Y forward	6.9%	5.6%	3.5%	4.3%	2.3%	1.0%
7-10Y / 7Y forward	6.5%	6.4%	4.1%	4.9%	2.3%	1.6%
7-10Y / 10Y forward	6.3%	5.8%	4.4%	5.6%	2.4%	1.6%
7-10Y / 20Y forward	5.1%	4.9%	3.7%	3.4%	3.6%	3.3%
20Y+ / 1Y forward	11.7%	1.8%	18.0%	-5.9%	14.0%	-8.8%
20Y+ / 5Y forward	8.5%	6.4%	6.7%	5.4%	1.6%	-0.2%
20Y+ / 10Y forward	7.6%	7.5%	6.8%	7.1%	2.9%	1.9%
20Y+ / 20Y forward	7.0%	6.6%	3.7%	4.9%	3.6%	3.5%

Source: FTSE Russell/LSEG. Data as of May 31, 2026. Monthly data from January 2000 to May 2026.

Conclusions

We find starting yields to be strongly correlated with future returns on US Treasury indices of varying maturities, over the period 2000-26, based on data from FTSE Russell constant maturity Treasury indices. These results are in line with the evidence from our previous research on US equities and high yield, and work across a range of yield quintiles.

Peak correlations occur where investment horizons most closely match the maturity of the underlying bond index, so short bond indices have the highest correlation with shorter investment horizon returns, and longer dated indices with longer dated returns. We concede statistical auto-correlation in returns and yields can distort correlations between yields and returns, but there are strong economic reasons for the correlation to be high anyway.

Carry and roll-down the curve are strong ongoing drivers of returns (assuming a normal, positively sloped yield curve for roll-down gains). However, mean reversion in yields causes price, or duration effects on returns to be variable, and overpowered by carry and roll-down in longer periods, even if duration effects can dominate in short periods for longer indices. This is evident when we assess the impact of changes in yields, in different yield regimes, and find that even during some rising yield regimes, returns are higher than in an equivalent falling yield regime, because of the positive impact of carry and roll-down.

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