

5 Key Questions on Duration

The first half of 2022 was the worst on record for many major bond benchmarks, which recorded double digit losses. Negative returns were the result of high levels of duration exposure in conventional portfolios, as central banks either started or foreshadowed aggressive monetary policy tightening to combat the highest level of inflation in decades. The size of drawdowns in duration-heavy portfolios, high bond volatility and commensurate weakness in riskier assets, led many investors to question the role of government bonds in broader portfolios.

At Ardea Investment Management, we have long believed there is more to fixed income than buying bonds for yield. We adopt a pure [relative value](#) investment approach that aims to be independent of the level of bond yields, the direction of interest rates and the macroeconomic factors that dominate the performance of conventional investments. Ardea explicitly avoid active duration risk as part of our investment process (see [here](#) for further discussion on how various fixed income strategies are impacted by the market environment).

However, as participants in global fixed income markets, many clients ask us questions on duration, and the outlook for bonds. While we don't use, or provide forecasts for bond returns or yield levels, we can offer some frameworks for thinking about duration in the context of current market dynamics and a multi-asset portfolio.

In this note, we answer these five key questions on duration:

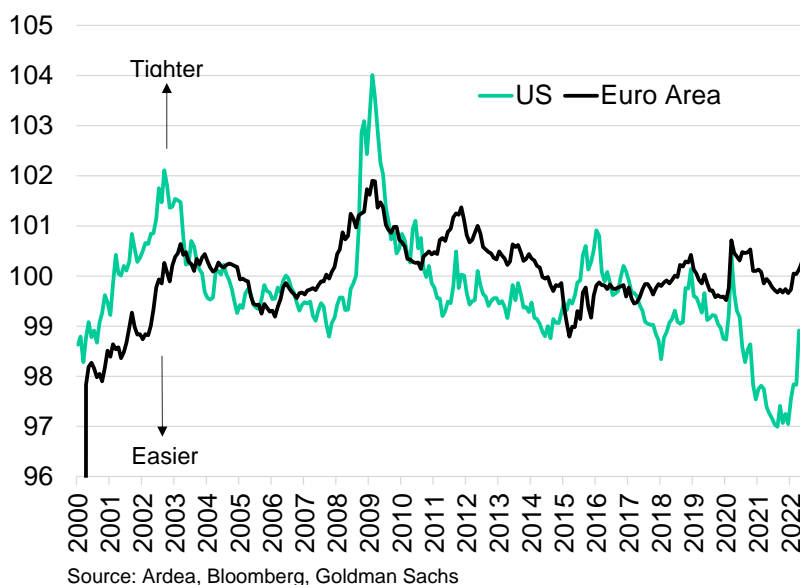
- 1) Is the worst period for bond performance behind us?
- 2) Are investors compensated by risk premia in the current environment?
- 3) What is the role of bonds in a multi-asset portfolio?
- 4) Is there more to a duration decision than yield levels and correlation with equities?
- 5) What is an appropriate framework for allocating to government bonds?

Is the worst period for bond performance behind us?

After an historically poor performance in H1, the worst period for bond returns may have passed. The H2 outlook for bonds appears more balanced, but a major turning point for yields could be elusive while inflation is yet to peak. Volatility is likely to remain elevated amid high levels of macro uncertainty and large two-sided tail risks. Markets are traversing concerns about surging inflation and rising recession risks, as central banks aggressively tighten policy into a global slowdown. The argument for a more balanced outlook for yields reflects three main drivers.

- 1) Tight financial conditions.** Broad measures of financial conditions have moved rapidly from historically easy levels post-COVID to now be at levels not far from the peak of previous tightening cycles (in the case of the US).

Chart 1: GS Financial Conditions Indices



These indices account for both the weakness in risk assets and higher yields. The peak-to-trough drawdown in S&P 500 in H1 is consistent with the average seen ahead of prior US recessions, albeit starting from a high valuation starting point (see our earlier [note](#) for more detail).

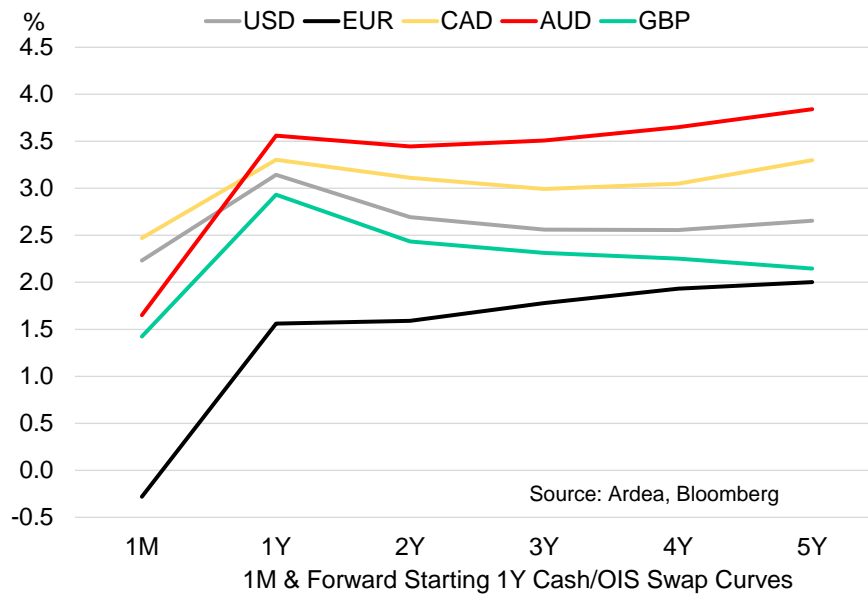
- 2) Improved value proposition from higher yield levels.** Yields are now at the highest levels in some markets for seven years or more. At current yield levels – upwards of 2.5% or more above post-Covid lows for 10y nominals – bonds provide more hedge value against weakness in riskier assets. Importantly, longer term real yields are now in positive territory – the US 10y moving from -1% to +0.6%.

Previously negative yielding nominal bond markets such as Europe now offer positive yields. The overall share of negative yielding debt in the Bloomberg Composite Index has collapsed from over 30% to less than 5%.

Higher yield levels reflect forward pricing for rate hikes into restrictive territory over the next year and

only some policy easing factored in thereafter (more in the US and UK, than Australia and Europe – a function of how progressed central banks are in respective tightening cycles). Just what is genuinely restrictive policy is a judgement call, but peak forward rates for markets such as the US and Australia are above model estimates for neutral. This pricing is an important consideration for many longer-term investors.

Chart 2: 1y Forward Rates – inversion in some markets

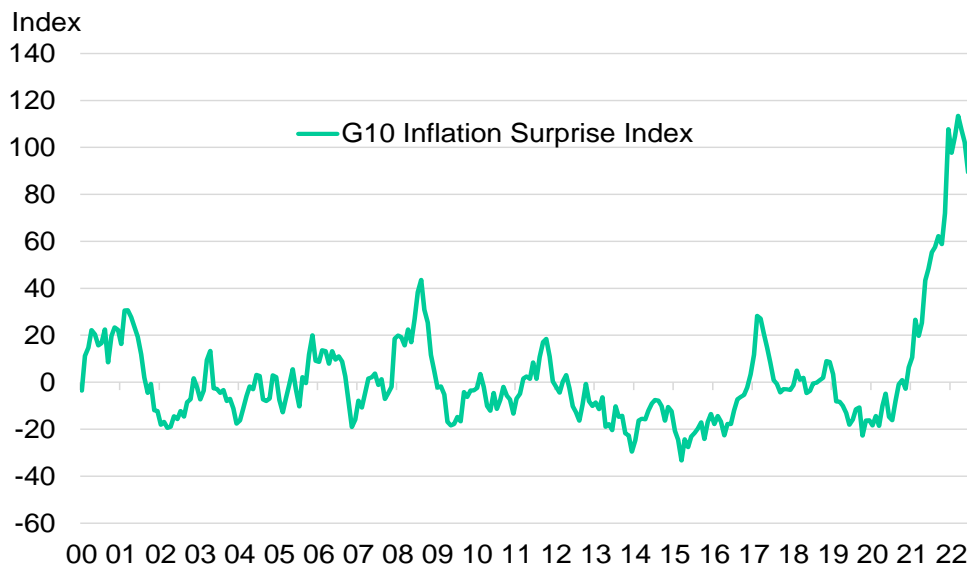


3) Growth slowdown. Forecasts for 2022 global growth continue to be revised sharply lower, as activity indicators slow. Some private sector economists look for advanced economy growth in 2022 of just 2.5% - less half the pace of 2021 (as noted in [5 Key Themes for 2022](#), the consensus to start the year was for growth to slow to only around 4.5%). Similarly, the JP Morgan global growth revisions index implies forecast reductions of around 1.5% over H1. Downside risks for Europe are compounded by the potential for an energy crisis and fragmentation risks in periphery markets as the ECB hikes rates.

Against these supporting factors, the real missing piece for bonds is a meaningful turn lower in inflation data (as discussed in prior [notes](#)). Signs of incremental slowing in inflation would see the market focus swing more meaningfully towards recession risks. Both market pricing and the consensus of economists are expecting peak in inflation sometime over the coming 6-12 months, generally supported by some combination of: 1) energy price base effects fading and lower commodity prices; 2) supply chain pressures easing (still over 2 standard deviations above average); 3) softer demand limiting wage-price pressures.

A key risk to current forecasts and market pricing is that inflation stays elevated for longer, which could see yields rise further still, especially if economies prove more resilient than the 2023 recession risks increasingly dominating market sentiment. Investor and central bank confidence in forecasts should be low, following a year of record upside surprises to inflation relative to forecasts.

Chart 3: G10 Inflation Surprise Index



Source: Ardea, Bloomberg

*Index below zero is inflation below expectations

Are investors compensated for risk premia in the current environment?

The fixed income market is currently facing somewhat binary tail risks between recession and prolonged high inflation, or perhaps both together.

While declining bond yields would benefit investors initially, at the same time higher inflation and lower ongoing returns from lowered yields are not a favourable combination for long term returns.

Given this challenging outlook it is reasonable to assess whether bond yields provide adequate compensation to investors for this uncertainty. One long-standing approach to this question is to assess the term risk premium on offer in the government bond market.

The term risk premium aims to capture the return or yield on offer from government bonds, over and above the expected return from holding cash for an equivalent period to the life of a government bond.

For example, at current 10y government yields in Australia of 3.5%, this might translate to a term premium of 0.50% over the cash rate if the cash rate were to average 3% over the same 10y period. If however the cash rate were to average 2.5%, this would equate to a term risk premium of 1% on a 10y government bond yielding 3.5%.

While there are many challenges in accurately measuring the term risk premium, given it can't be observed directly, this framework provides us with a useful lens to compare current bond yields to historical levels. What we find is that when cash rate expectations are higher, the term risk premium is higher too. This produces bond yields that rise by more than just the increase in cash rate expectations alone.

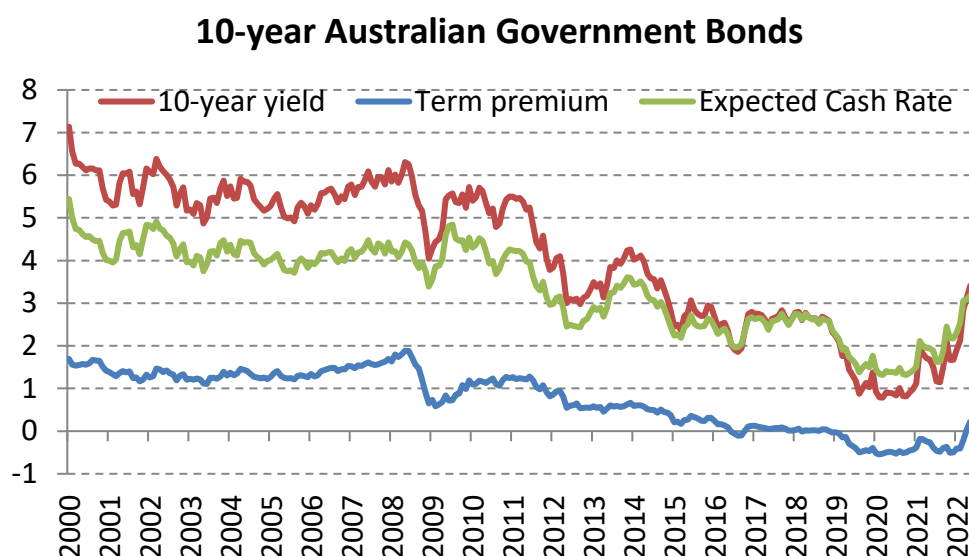
This perspective can help investors form expectations about whether fixed income offers appropriate compensation for risk at given yield levels, and how this relates to cash rate expectations.

For example, taking the view that inflation in Australia averages 2.5% over the long term, a long-term cash rate of 2.5% would represent a real cash rate of zero. If one took the view that Australia should be able to

deliver positive real cash rates over the long term, average inflation of 2.5% plus a positive real cash rate of 0.5% would translate to a long-term nominal cash rate of 3%. Current bond yields of 3.5% would provide only a 0.50% term risk premium above this number, thus providing compensation that is perhaps adequate, but not generous, and not comparable to longer term risk premium averages of around 1-2%.

The 10-year bond yield, the expected cash rate for 10 years, and the resulting difference which is the term risk premium are shown below. While there are numerous statistical and methodological limitations to this approach, it provides a further reference point in assessing the degree of comfort provided by current bond yields.

Chart 4: Australian 10y yield decomposed



Source: Ardea, Australian Office of Financial Management

What is the role of government bonds in a multi asset portfolio?

In general, the role of government bonds in a portfolio is to provide volatility reduction. Bonds will continue to lower portfolio volatility if bond volatility is lower than equity volatility, even if the correlation is positive. While better outcomes can be achieved under negative correlation, this is secondary to the impact of relative volatility. And this is true if we are in a low yield environment or a rising rates environment.

Adding government bonds reduces expected portfolio returns. However, focusing on returns overlooks two important considerations.

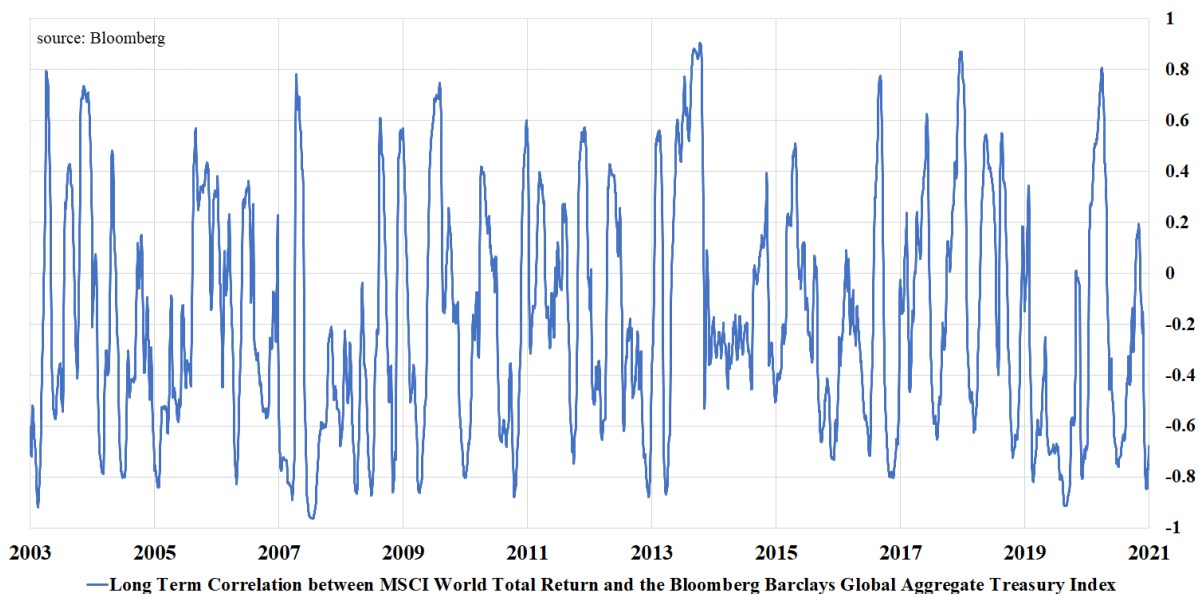
The first is the relative expected returns between equities and bonds. If the return distributions for both bonds and equities have shifted to the left or to the right to a similar degree, then the trade-off remains the same. The relative returns between equities and bonds is an important issue for portfolio construction, but one that might be separated from the question of whether bonds still reduce portfolio volatility.

The second consideration is whether bonds have really lost their ability to provide volatility reducing benefits because of an increase in the correlation between equities and bonds or an increase in the absolute volatility of bonds. It is the relative volatility that matters the most. If bonds exhibit lower volatility and smaller

drawdowns than equities over the investor’s investment horizon, then they will reduce the volatility on an equity heavy portfolio.

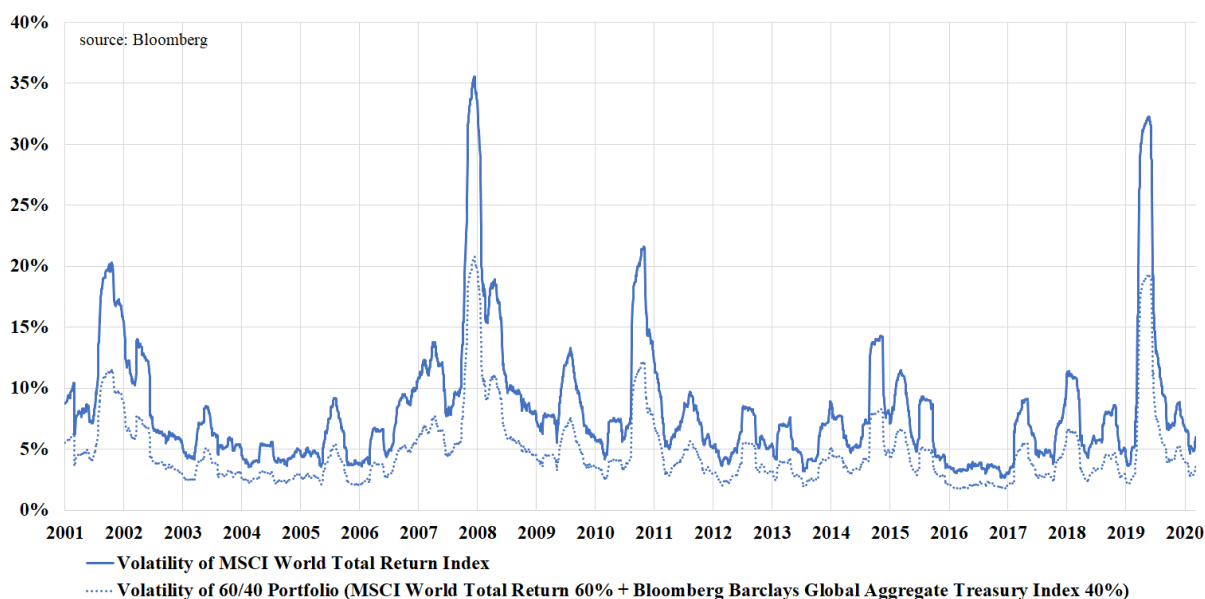
Some investors saw the preceding lower yield environment and the observed positive correlation between bonds and equities as weakening the case for government bonds in an equity heavy portfolio. However, ignoring returns for the moment, the case for bonds remains the same whether we are in a low yield environment or a rising rates environment. Correlation has never been consistently negative as we can see in the chart below, yet bonds have historically lowered volatility. This is almost entirely due to bonds exhibiting lower volatility than equities.

Chart 5: Long – Term Correlation Between Equities and Bonds Over Rolling 60 Month Periods



If correlation was driving the risk reduction of combining bonds with equities, then one might expect that the volatility of a balanced portfolio might fluctuate markedly versus that of equity. The chart below reveals that this is not the case. Volatility for a 60/40 equity/bond portfolio is consistently lower than that for equities, with an average reduction of about 4%. Clearly the lower volatility of bonds is dominating over correlation effects.

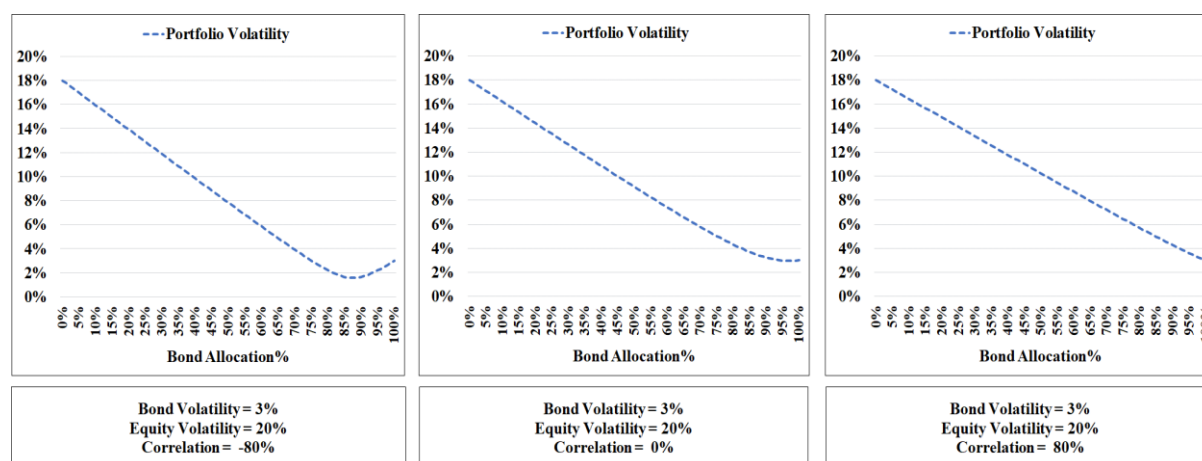
Chart 6: Volatility of World Equities versus 60/40 Equity/Bond Portfolio Over Rolling 60 Month Periods



We explore this further with some simple modelling. First let's look at the importance of correlation when bond volatility is low using the three charts appearing below, under which all inputs stay the same except for correlation. In the boxes below each chart are the assumptions. Both bond and equity volatility remain constant at 3% and 20% respectively across the three examples, with correlation varying from -80% in the first box, 0% in the middle box and +80% in the last box.

First consider the -80% correlation chart on the left, and focus on the total portfolio volatility dotted line as the bond weight varies from 0% to 100%. Portfolio volatility steadily decreases as bond weights increase up until around 89%, and then rises slightly. Bonds not only act as a diversifier but also consistently reduce volatility until they form the bulk of the portfolio under a substantially negative correlation. Shifting to the 0% correlation chart in the middle, again portfolio volatility decreases as the bond weight increases – in this case up to 98%. Finally, the 80% correlation chart on the far right shows that minimum portfolio volatility is attained at a 100% bond weight.

Chart 7: Effect of Varying Correlation Under Low Bond Volatility



If we compare the total portfolio volatility line across charts, we can see volatility decreases faster at the portfolio level when correlation is negative. That is, better outcomes can be achieved if correlation is negative. However, what matters most is the relative volatility between equities and bonds. When bond volatility is relatively low, bonds still provide diversification even if correlation is positive. You can read more about our study of correlation between bonds and equities [here](#) or you can listen to our podcast [here](#).

Is there more to a duration decision than yield levels and correlation with equities?

This can't be a one size fits all answer because there are some additional questions that need to be asked:

1. How much duration do you have in your portfolio already? A 40% allocation today is not the same as a 40% allocation 10 years ago. When rates decline, duration lengthens. As duration increases, so does the exposure to interest rate changes. If we consider an allocation to the Barclays Global Aggregate, a 40% allocation in 2001 was 2.2 years a 40% allocation in 2020 was 3.6 years.
2. What is your investment horizon and do you think that bonds will exhibit lower volatility relative to equities over this horizon? More concretely, what are your expectations for the volatility of government bonds over your investment horizon relative to equities?

3. Over your investment horizon what are your expected returns as a function of the desired duration exposure you have in your portfolio? This is important because a higher duration portfolio takes longer to recover from capital loss as a result of rising rates than a shorter duration portfolio, but over the longer term if the yield curve is upward sloping then a longer duration portfolio should exhibit higher returns.
4. And then finally is the risk return ratio a good ratio compared to the other asset classes on the menu?

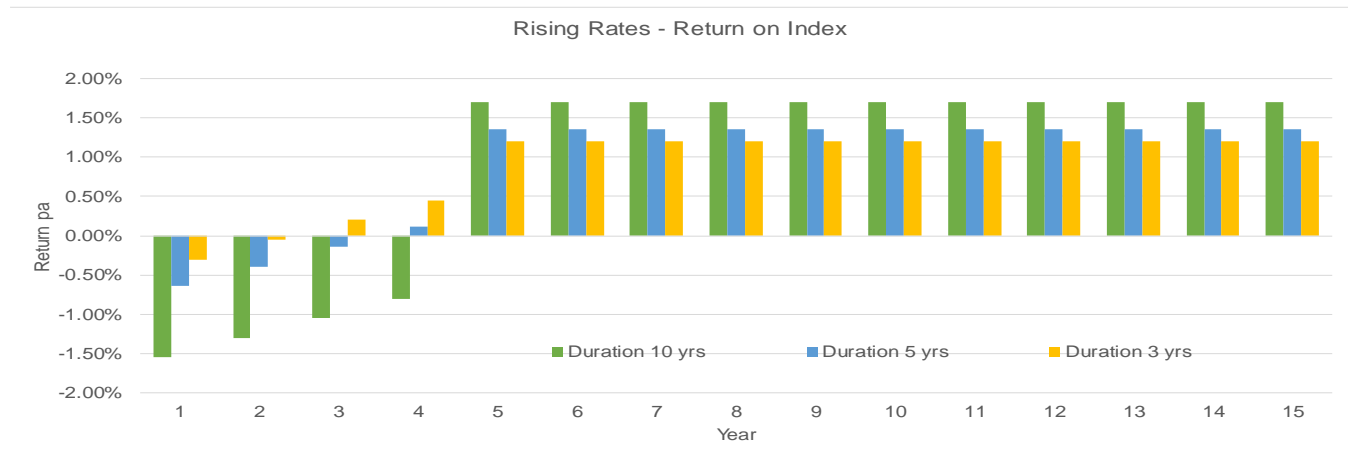
To help investors understand the interaction between horizon and duration exposure we have modelled a rising rates scenario for various duration exposures. In the second row of the table below we can see that the assumed carry is 0.7% for the 10 year duration index. Carry is another word for return and we have estimated carry from the yield to maturity. If central banks made no changes to policy rates, then every year that 10 year bond index would return 0.7% (and we see that for year 1 and year 2). But in year 3, central banks raise rates by 0.25% and we know that if rates rise then bond prices decline and that's why we see the negative return in year 3. If we look at year 4, again we see that there is a negative return, but it is less than in year 3 and the reason for that is, that in year 3 there was an interest rate rise which means that the yield on the portfolio increased by 0.25% and this negates some of the loss from the rate rise in year 4. In years 5 and 6 we see a similar pattern where the rate rises have a diminishing impact because the previous year's rates rises have increased the yield on the index. By year 7, there's no more rate rises, and now the investor can benefit from higher returns as a result of the previous rate hikes.

Let's consider the next row down (the index with a duration of 5 years). The yield to maturity on this index is 0.36% so we estimate the return each year to be 0.36% if interest rates stay the same. In year 3 when interest rates rise, we see that the negative return is not as large as for the 10 year index, however we see the same pattern as for the 10 year index (once all the rate hikes are finished the investor is now earning a higher return).

An interesting point to note is that when we compare the return p.a. over a 10 year period vs a 15 year period for each index (shown in the box on the far right) we can see that over the 10 year horizon, rising rates increased the expected return per annum for the 3 year and 5 year index when compared to their initial carry. For the 10 year index the return per annum over 10 years is less than if there were no rate rises. However, we can see that over the longer horizon of 15 years, rate rises were good for all indices. This tells us that both the duration of the bond investment combined with the investment horizon are both important inputs into determining expected return.

Chart 8: Modelling Return Outcomes As A Function Of Duration Exposure and Horizon

Duration on index	Rate rises 0.25% 0.25% 0.25% 0.25%																Return Pa (10 Years)	Return Pa (15 Years)	
	Carry	YTM	1	2	3	4	5	6	7	8	9	10	11	12	13	14			15
10	0.70%	0.70%	-1.55%	-1.30%	-1.05%	-0.80%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	1.70%	0.54%	0.93%
5	0.36%	0.36%	-0.64%	-0.39%	-0.14%	0.11%	1.36%	1.36%	1.36%	1.36%	1.36%	1.36%	1.36%	1.36%	1.36%	1.36%	1.36%	0.71%	0.92%
3	0.20%	0.20%	-0.30%	-0.05%	0.20%	0.45%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	0.75%	0.90%



A high level framework for approaching the duration decision may include scenario testing which considers the different:

- Levels of duration exposure
- Rising and declining rates scenarios
- Various relative volatility assumptions
- Various relative return assumptions
- Probabilities (conviction) of each of the scenarios

What is an appropriate framework for allocating to government bonds?

Of course, there is no 'right' answer to this question of whether to add duration right now. For each investor, this depends on a wide range of factors and should be considered in the context of a holistic framework for managing key risk exposures - equity, credit, rates and FX - at the total portfolio level.

In the first instance, investors need to consider their objectives while accounting for their operating environment, including the constraints they face. For example, the approach of superannuation funds navigating the Your Future, Your Super performance test while trying to maximise long-term real returns for their members will necessarily differ from that of liability-driven investors like insurers and defined benefit pension schemes subject to their own distinct regulatory requirements.

Investment horizon and risk appetite will strongly influence strategic exposures to key risk factors (including rates) and the extent to which investors are prepared to dynamically manage these exposures. Strong governance and robust systems are also required to support these aspects of an investment process, particularly dynamic asset allocation.

A common language of risk and return is a powerful lens to underwrite a framework for (strategic and dynamic) exposure management in a diversified portfolio. Not only does this allow investors to evaluate their entire opportunity set on a consistent basis and better allocate the marginal dollar of active risk, but also to map every portfolio holding to a proxy based on broad market betas – equity, credit, rates and FX – that can then be aggregated to a total portfolio view of common risk factors. This is the natural starting point for managing – or rather completing – the portfolio to a set of desired targets for these risk factors.

For example, investors need to understand the embedded duration across their portfolios to make an informed decision about positioning their rates allocation. Real assets like infrastructure and property are heavily exposed to real interest rate duration while some absolute return strategies can exhibit a structurally long exposure to nominal rates.

To meaningfully quantify this embedded duration and the portfolio level rates allocation, it may also be helpful to consider rates in duration equivalent terms – say 10 years for simplicity. This will avoid potential misrepresentation of the allocation and its underlying risk by aggregating the notional value of portfolio positions with divergent durations.

Any framework for exposure management employs valuation signals, both absolute and relative. In the case of rates, the forward-looking term premium is one of the most common fundamental measures of value that has particular utility for long horizon investors. There are many other signals investors can use to evaluate the investment case for rates – these range from other fundamentals like curve steepness, various cyclical metrics, or shorter-term indicators related to momentum, investor sentiment or speculative positioning.

It is possible to design a consolidated valuation signal (or set of signals) that incorporates some or all of these metrics. This is best achieved by first standardising the underlying components and then risk-weighting their contribution to a set of signals tailored to an investor's requirements.

The framework should also produce estimates of expected risk and return, with risk captured across multiple dimensions. Here scenario analysis (see above) is particularly valuable for testing portfolio robustness to different regimes and identifying potential vulnerabilities or imbalances. While these vulnerabilities cannot always be mitigated, at the very least the potential consequences should be understood.

The scope of any framework should encompass implementation, including the best 'access points' to attractive risks. In the case of rates, this might include discussions on curve positioning, trade-offs around capital efficiency (i.e. synthetic vs. cash exposure) and optionality.

Investment frameworks like this are not infallible, nor is the decision-making that relies upon them. When things don't go to plan, the quality of its governance and culture will determine how successfully an investor responds to the challenge.

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