Allianz Global Investors

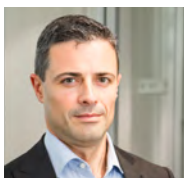
FIXED INCOME
ADVANCED INSIGHTS

Risk management in bonds

Beware the dominance of duration and yield curve positioning

Almost all of a typical bond portfolio's outperformance or underperformance is explained by duration and yield curve positioning. In the second in our new series on fixed income investing techniques, we explain that a better approach is to spread risk more widely.

Which is preferable: a better return or a better risk-adjusted return? Bond investors cannot target both outcomes at the same time. They must aim for one or the other, and for many institutions the prudent choice is risk-adjusted returns. In other words, they need to optimise performance within the amount of risk they are willing and/or able to take.



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Due to intrinsic qualities of bonds that we will discuss in this article, risk in fixed income tends to be concentrated in certain risk factors. The most important are the portfolio's duration – ie, its price sensitivity to changes in interest rates – and its yield curve positioning, ie, its exposure to steepness changes between bonds of different maturities.

Manipulating these factors can be an effective way to add risk – and potentially achieve outperformance. But is it the most efficient way? We think a more advanced approach, which diversifies risk over many risk factors, is more likely to achieve the best risk-adjusted returns.

Why adjust for risk?

Considered in aggregate, bonds are traditionally – and rightly – viewed as a low-risk asset class. By this we

Key takeaways

- Many institutional investors operate under constraints and rely on their bond investments to generate steady returns with low volatility.
- Academic research suggests that changes to the level and shape of the yield curve account for a high percentage (typically around 95%) of the variance for a typical US Treasury portfolio.
- Spreading risk across other risk factors, such as currency risk and liquidity risk, may offer a better chance of achieving optimal risk-adjusted returns.

mean that within a typical investor's strategic asset allocation, bonds are expected to provide a steady stream of returns with relatively low volatility.

It is important for institutional investors that the bonds in their portfolios behave in this way. Pension schemes have a responsibility to meet the needs of their beneficiaries; insurers must cover the cost of claims; central banks must manage their reserves in the best interests of the country.

If they are to achieve these goals, investors cannot pursue the best returns at any cost – an approach that could expose them to significant volatility in their bond holdings. Rather, they want the best return *per unit of risk*.

This risk tolerance can be expressed in terms of tracking error – the difference in performance between a portfolio and its benchmark.[1] It is the investment manager's job to achieve the best possible return within an agreed tracking error target.

Risk in fixed income – where duration comes in

It follows that a prudent investment approach will examine the sources of risk in fixed income. An obvious one is default risk – **investors must guard against issuers failing to pay them what they are owed**. Others include currency risk, liquidity risk and political risk.

However, among all these risk factors, there are two that have overwhelmingly the most influence on a typical portfolio's returns: duration and yield curve positioning. Duration, as mentioned, expresses how a portfolio will respond to changes in interest rates.[2] Yield curve positioning expresses how a portfolio will respond to changes in the yield curve's shape.

We know about the importance of these twin elements thanks to an academic study published in 1991 that examined the returns of US Treasuries.[3] The researchers looked at weekly returns of a portfolio of Treasuries between 1984 and 1988 to identify the components influencing excess returns. They reached the startling conclusion that an average of 97% of the total variance was explained by three factors of the yield curve: its level, slope and curvature. (While slope and curvature refer to shape, the level of the curve reflects the interest rate and is therefore linked to duration.)

It's not that other risks had no effect. But according to the research, "specific risks that influence securities individually" tend to have a negligible effect on a diversified portfolio, while systematic risks relating to the yield curve have a general and more significant impact.

Duration and yield curve, the only game in town?

No wonder bond managers spend so much time thinking about interest rates and yield spreads. The study confirms what bond managers already know – that the easiest way to achieve outperformance is to make accurate calls on duration and yield curve positioning. You could say these are the most effective weapons in the bond investor's arsenal.

But these same weapons also have the potential to introduce significant volatility. And if the goal is risk-adjusted returns, high volatility is unwelcome. So, we think investors should consider a different approach – one which does not treat duration and yield curve positioning as the only game in town. Rather than spend all the risk budget on these twin elements, this more advanced approach would seek diversification across risk factors – such as sector, currency, quality and spread – within an investor's agreed tolerance.

(Note that the study mentioned above does not say that duration and yield curve positioning *must* account for 97% of risk in a bond portfolio. It is possible to construct a portfolio where these factors account for as little as 5% of the risk budget.)

We believe such an approach has a better chance of achieving the steady and stable returns that institutional investors expect and require of their bond holdings. In the third and final instalment of this series, we will examine this approach in detail.

Read the first article in this series:
The art of avoiding defaults: why credit risk is crucial for bond investors

Footnotes

1) Tracking error is calculated as the standard deviation of the difference between the returns of the portfolio and the benchmark.
2) One way to think about duration, which is measured in years, is that it reflects how long it will take to receive all cash flows from the bonds in a portfolio. A portfolio of mainly long-dated bonds such as 30-year Treasuries will have a higher duration than one invested in short-dated bonds. Because a long-duration portfolio has more exposure to future cashflows, it will be more impacted by a change in interest rates.
3) Litterman, Robert; Scheinkman, José (1991), "Common factors affecting bond returns". The researchers found that in the period studied, their three-factor approach explained "no less than 94% of the total variance of returns. On average, it explains about 97%."

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