

# EXTRACTING VALUE FROM INDEPENDENT FIXED INCOME ALPHA TEAMS USING DYNAMIC RISK BUDGETING

Traditionally, institutional investors have tended to see fixed income as a choice between sovereign and credit risk, with little attention being paid to risk budgeting. However, there is a multitude of other fixed income markets from which we can actively source alpha utilising autonomous alpha generating teams with the requisite insight and skill. Moreover, when these independent sources of return are combined through intelligent risk-budgeting, together with a coherent beta replication strategy in a globally diversified fixed income portfolio, the risk-adjusted returns from fixed income can be potentially enhanced.



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Joined the investment industry in 1995 and Aviva Investors in March 2011.

**Main responsibilities**

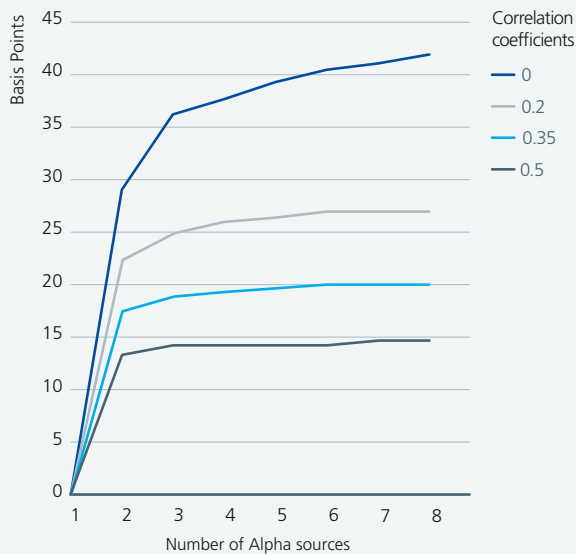
Dan is responsible for the performance, growth and development of Aviva Investors Global Fixed Income strategies.

**Experience and qualifications**

Dan joined Aviva Investors from Fischer Francis Trees & Watts (FFTW), where he was Chief Investment Officer (CIO) for absolute return, portable alpha strategies and short duration aggregate fixed income. He has also held senior roles at Fortis Investments and ABN AMRO Asset Management, including CIO for absolute return; head of portable alpha strategies and CIO for global aggregate fixed income. Dan began his career as a portfolio manager specialising in high net worth client portfolios at Mercury Asset Management in London.

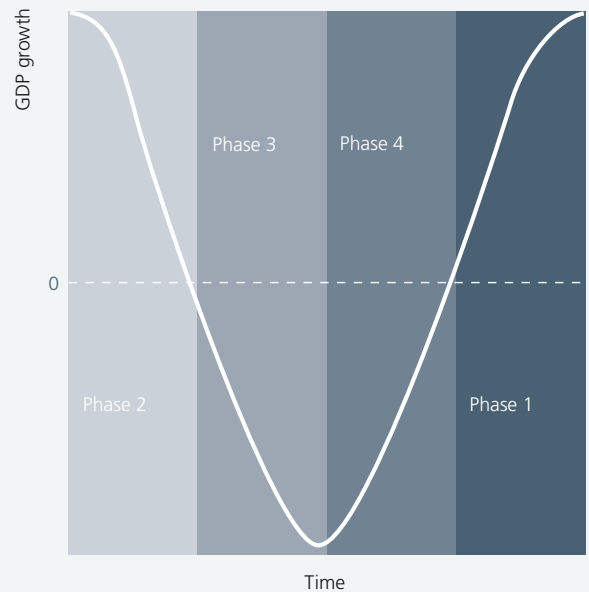
Dan holds the Investment Management Certificate from the CFA Society of the UK.

**Figure 1. Marginal contribution to diversification**



Source: Aviva Investors

**Figure 2. Tracking GDP over cycles enables us to identify where we are in the current cycle**



Source: Aviva Investors

**Generating enhanced risk-adjusted returns**

In order to generate portfolio returns one has to take risk in a controlled fashion and embrace the concept of overlay. But how is this best achieved? Taking a closer look at the equation for modern portfolio theory for risk-adjusted returns devised by Grinold and Khan<sup>1</sup> – which is not as scary as it looks – is instructive. This can be summarised as follows:

$$\frac{ER}{\sigma} = IC \cdot TC \sqrt{n}$$

Quite simply,  $ER/\sigma$  is the risk-adjusted expected return, or information ratio (IR) of the alpha within a fixed income portfolio. This is a function of three things. Firstly, there's IC, the information content, or the skill of independent alpha generating fund management teams operating in their respective fixed income asset classes. This skill is measured in its simplest form in terms of each team's delivered absolute or relative returns over time. Then there's  $\sqrt{n}$ . This refers to the breadth, or number, of alpha generating

teams from whose skill sets the global aggregate fixed income portfolio manager can draw. Breadth can be viewed as the marginal contribution to portfolio diversification from each additional alpha source (see Figure 1). The relationship is exponential rather than linear.

Taking a simple portfolio in which the risk attached to each alpha generating team is assumed to be equal, and where a positive correlation of 0.35 between each is assumed, Figure 1 suggests that the optimal number of teams is six to seven. As the level of correlation decreases, the optimal number of alpha teams or breadth increases, thus demonstrating the importance of sourcing alpha from autonomous teams to ensure that the correlation of returns is minimised. We will discuss later how this can be achieved.

Finally, there's TC, the transmission coefficient. Often the most challenging component of the equation, the transmission coefficient captures how well alpha ideas are translated into a coherent portfolio. This is best achieved when alpha generating managers are allowed to invest in a relatively unconstrained

manner, subject, of course, to agreed risk parameters. This latitude should extend to allowing teams to employ derivatives, given the liquidity and efficiency they afford in portfolio construction and implementation of investment ideas, focusing on specific risk dimensions.

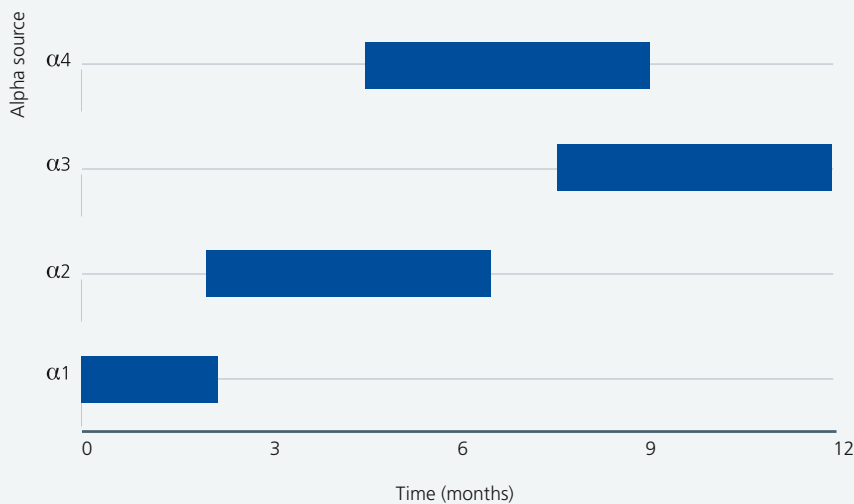
So how does one decide whether, and how much, to allocate to each alpha generating team? The key to this is in understanding where we are positioned in the market (or investment) cycle, which we segment into four phases.

To help us do this we have developed quantitative techniques for tracking GDP, as illustrated in Figure 2, which together with various risk appetite indices provides an insight into the macro environment and the appetite for active risk positions. In addition to this we can map the expected returns of each fixed income asset class – the market (beta) returns – throughout the cycle and ascertain the expected return scenarios given our cycle positioning.

However, it is important to stress that we

1. Richard C. Grinold and Ronald N. Kahn, *Active Portfolio Management: A Quantitative Approach for Providing Superior Returns and Controlling Risk*. McGraw-Hill (1999) p.xiii.

**Figure 3. Compound total returns by asset class – 1979-2009**



Source: Aviva Investors

are talking about the alpha generation capabilities of specialist teams within specific fixed income asset classes, rather than teams that simply gain exposure to the asset class per se. This is paramount as the resulting alpha returns within a specific asset class are often delivered with a lower volatility than one would experience by being outright directionally long or short the underlying asset classes. Returns are also likely to have a lower correlation with each other than would be the case if market (beta) exposures were the source of returns. We believe that alpha is generated through three distinct manager styles, namely mean-reversion, trend-following and carry-orientated strategies, as illustrated in Figure 4.

Within the context of these three manager styles, time horizon and methodology are important factors to consider.

#### Time horizon

The return series can be further diversified by trades with different time horizons. Indeed, it is quite feasible for one alpha team to be long and another team to be short the same market factor, with both positions supported by compelling trade theses. For example, the sovereign debt team may have a long-term strategic long bias to five-year interest rates based on fundamental factors, while the quantitative strategies team might have a short-term directional short position. Allocating appropriate proportions of the portfolio's risk budget to both positions

is perfectly rational because, over the cycle, they are likely to aid diversification, enhance returns and reduce overall portfolio risk.

Figure 3 shows the importance of exploiting alpha generated over different time horizons in order to capture trade theses that focus on individual dimensions of risk across the investment cycle.

#### Methodology

Quantitative and qualitative decision making processes can both add significant value. For instance, quantitative processes typically perform well in a trending environment because emotional drivers, or behavioural factors, can force qualitative processes to exit a trend early or late<sup>2</sup>. However, qualitative processes perform well across the market cycle if there is sufficient flexibility to use risk budgets consistently. These processes include the ability to assess and implement relative value and mean reverting strategies as well as performing the underlying fundamental analysis behind certain carry strategies.

Observing how alpha is generated by each investment team provides interesting insights. For example, if one looks at the volatility of high yield as an asset class since October 2008, this demonstrates ex post volatility of approximately 5.22 per cent. However, the volatility of our high yield process has delivered enhanced risk-adjusted returns at an average volatility of 2.92 per cent<sup>3</sup>.

2. These comprise biases such as the disposition effect that derives from loss aversion – the dominant motivation to avoid losses.

3. Source: Aviva Investors. Barclays Capital Global High Yield ex-CMBS/EMG 2% Capped Index versus the volatility of the excess returns from the Aviva Investors Global High Yield Composite, using 100 day rolling volatility 1 October 2008 to 31 July 2011.

Indeed, an intelligent global<sup>2</sup> high yield alpha process might focus on capturing the yield premium over that from a risk-free asset, while protecting the underlying capital and reducing the correlation between the strategy and high yield market returns, thereby providing an attractive return series as part of the desire to achieve a portfolio of uncorrelated returns. We therefore need to think about how each of the alpha teams delivers returns throughout the investment cycle, as this will determine their ability to use risk and generate returns. For example, when credit spreads were tight and volatility low in 2006 and H1 2007, the opportunity set for credit was significantly reduced. Indeed, investors were overwhelmingly focused on trades demonstrating a strong carry bias, where credit securities were held for their excess yield premium to risk-free assets. However, many investors were caught long and wrong in H2 2007 when credit spreads widened dramatically, negating the yield premium and resulting in the type of capital drawdown “event” illustrated in Figure 4.

**Liquidity**

Events such as these highlight the importance of continually assessing liquidity conditions when analysing the opportunity set of each fixed income alpha team. Moreover, the ability to use derivatives to assume investment positions is crucial if one is to focus on the specific risk elements that each individual strategy targets.

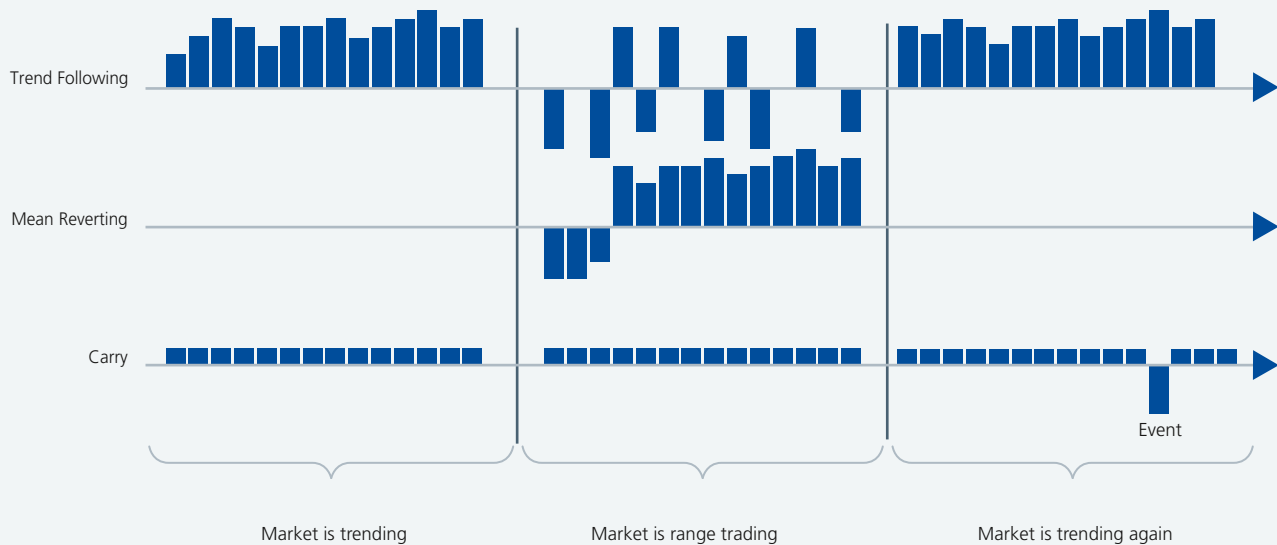
**Risk concentrations**

Another key consideration is what happens when there are large directional biases building in the overall portfolio. Would you cut positions that are correlated and directional? In fact, this would be detrimental to the extraction of alpha from each of the independent teams because it would directly interfere with their individual processes. Instead, the best approach in our view would be to hedge the potential downside risk through option strategies at the aggregate portfolio level, thereby avoiding the need to exit and re-enter the positions, avoiding the associated transaction costs. This ensures that the alpha teams remain autonomous in their delivery of investment ideas.

**Allocating the risk budget**

Earlier we mentioned how knowing where we are in the market cycle and being able to gauge the market’s risk appetite enables us to decide whether, and how much, of our risk budget to allocate to each of the alpha generating teams. However, in addition and in order to compare the delivery of alpha across the alpha teams, two key risks demand consideration. The first is the volatility of the alpha returns of each of the individual alpha teams over time. The other is the expected capital shortfall, or potential drawdown, of each alpha team throughout the market cycle, based on an analysis of historic drawdowns.

**Figure 4. The three main manager styles**



Source: Aviva Investors

**Table 1. Assumed and realised alpha stream correlations**

a. Assumed alpha stream correlations							
	Global rates	Global inflation	Quant strategies	FX	Global credit	EM local	EM external
Global rates	1.00						
Global inflation	0.35	1.00					
Quant strategies	0.35	0.35	1.00				
FX	0.35	0.35	0.35	1.00			
Global credit	0.35	0.35	0.35	0.35	1.00		
EM local	0.35	0.35	0.35	0.60	0.60	1.00	
EM external	0.20	0.20	0.50	0.50	0.60	0.60	1.00

b. Realised alpha stream correlations for the 17 months to 31 July 2011 <sup>4</sup>							
	Global rates	Global inflation	Quant strategies	Global credit	EM local	EM external	
Global rates	1.00						
Global inflation	0.18	1.00					
Quant strategies	-0.15	-0.16	1.00				
Global credit	-0.47	-0.24	0.72	1.00			
EM local	-0.02	-0.03	-0.04	0.07	1.00		
EM external	-0.26	0.03	0.12	0.29	0.80	1.00	

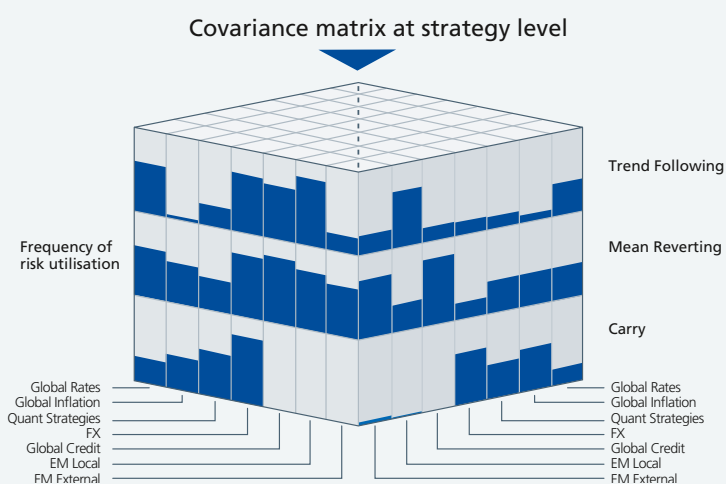
Source: Aviva Investors

**Table 2. Allocating the risk budget to the Alpha teams**

Alpha strand	Target risk (bp)	Maximum risk (bp)	Information ratio	Expected excess return (bp)
Global rates	180	270	0.5	90
Global inflation	70	105	0.5	35
Quant strategies	80	120	0.4	32
FX	100	150	0.5	50
Global credit	80	120	0.4	32
EM local	30	45	0.5	15
EM external	30	45	0.5	15
Total	397	596	0.678	296
Total undiversified	570			

Source: Aviva Investors

**Figure 5. Covariance matrix at strategy level**



4. As FX has less than a 17-month track record, it is not shown in the realised alpha stream correlations.

For example, if two alpha streams exhibit equal volatility over time, one can argue that the risk budget should be allocated on a 50/50 basis. However, if the second alpha source has an expected shortfall of 100bps versus the first alpha source's expected shortfall of 50bps, a 50/50 allocation would not be optimal. Factoring the ratio between the risk and the expected shortfall into the risk budgeting process can reduce the adverse effect on the portfolio of subsequent capital drawdowns.

The assumptions made at this stage of the risk budgeting allocation process are deliberately conservative. The correlation coefficients between the alpha streams are assumed to be positive, and a clear distinction is made between 'rates' focused and 'risk asset' focused streams, with a higher level of correlation assumed for the latter. Moreover, by assuming equal levels of skill over time, the assumed information ratio is the same for each alpha team.

Table 1 shows the assumed and the realised alpha team correlations. The realised correlations are typically lower than those forecast, so providing investors with a level of protection against potential increases in realised correlations over the investment cycle.

Once established, these parameters are then taken into the risk budgeting process, where a qualitative overlay

finalises the risk budget to be allocated to each alpha team. This should be reviewed each quarter and monitored daily. Material changes to the structure of the alpha teams, sharp moves in the perception of the market cycle positioning, as well as material changes in liquidity and the defined trading environment should trigger a formal intra-quarter review of how the risk budget is allocated.

Table 2 shows a sample risk budget allocation for a globally diversified fixed income portfolio, with the allocation of target risk to each of the alpha teams. The alpha teams are responsible for delivery of investment strategies to fill the assigned risk budgets. There is no value in allocating risk to a team whose ability to use that risk is limited, with the result that they are destined to underperform. This approach to allocating target risk also ensures that portfolio risk is managed at the individual alpha team level, thus ensuring that the overall risk parameters are maintained throughout the investment cycle.

The resulting portfolio can be depicted in the form of a cube, illustrating each team's style of risk-taking and the frequency with which they use that risk. This facilitates the decomposition of risks and styles in the portfolio, whether from a carry perspective, or to view the risk and correlation of directional strategies in the portfolio, or assess return attribution. This is shown in Figure 5.

## Conclusion

Rather than being a choice between sovereign or credit, fixed income offers a wide choice of asset types and independent sources of returns that can be accessed through the skills of alpha generating fund management teams. At a time when the outlook for most asset classes suggests that returns will be lower than those which investors have come to expect, and with investment cycles shorter and more volatile, we believe that investors should consider broadening their return sources and seek intelligent and coordinated approaches to risk-budgeting.

Globally diversified fixed income investing is designed to bring together the best investment ideas developed by autonomous alpha teams in a coherent, risk-controlled portfolio that also incorporates a beta replication strategy. By combining multiple independent return sources, it provides the potential to achieve better risk-adjusted returns than through being directionally long or short underlying fixed income asset classes. Importantly, the approach succeeds in blending strong risk controls with "freedom to perform". By providing a risk-budgeting framework at the overall portfolio level, a globally diversified fixed income approach can enable active managers to focus on translating trade ideas in a benchmark-unconstrained manner into absolute returns.

### Key points

- Globally diversified fixed income investing brings together beta replication strategies and investment ideas developed by individual alpha teams, and combines them in a risk controlled portfolio.
- Combining independent return sources in a globally diversified fixed income portfolio provides the potential to achieve better risk-adjusted returns than through being directionally long or short underlying fixed income asset classes.
- Globally diversified fixed income investing looks for diversified sources of return by employing quantitative and qualitative decision-making processes, distinct manager styles and investing across different time horizons.
- The key to translating alpha ideas and skills into a coherent portfolio lies in understanding where we are in the investment cycle and using this knowledge to apply intelligent risk-budgeting in assigning allocations to alpha-generating fund management teams.
- Globally diversified fixed income investing provides a risk-budgeting framework within which skilled active managers are able to focus on translating trade ideas into returns in a relatively unconstrained manner.

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