

In the second article of this series, **Paul Greenwood, Marcus Mollan** and **Andrew Walker** of the Pension Solutions Group, RBS Global Banking & Markets,

consider how to translate objectives coherently into an appropriate asset allocation strategy.

#### Executive summary

- Sensible pension scheme risk management does not necessarily mean selling equities and buying bonds. Rather it is about the trustees and sponsor agreeing an acceptable risk budget and then generating maximum returns within that budget.

When determining an appropriate investment strategy for a pension scheme, by far the hardest task is to articulate and prioritise objectives and risk tolerances ('risk budgets'). The days of nebulous objectives such as 'maximise return while minimising risk' are thankfully over. Trustees and corporates now spend more time intelligently considering the nature and size of a broad range of pension risks.

Although trustees are engaging more robustly in negotiations with the scheme sponsor, many also realise the importance of being sympathetic to the sponsor's concerns. Treasurers can help trustees set

appropriate objectives and risk budgets by explaining the situations where the corporate will likely feel the most pain and struggle to meet or accelerate its pension contribution commitments.

For corporates that hold no truck with the financial economic arguments that point to complete scheme derisking, calculated risk-taking is a necessary part of running a defined benefit scheme. It is rash to take risks that have little prospects of meaningful reward, and certainly not in the interests of shareholders and pension scheme members.

Similarly, it should be in everyone's interests to sweat the assets as much as possible subject to an appropriate constraint on the total risk being taken. Determining

the sponsor's risk budget and communicating it to the trustee is critical to the process.

**HOW BAD IS BAD?** Value at risk (VaR) is widely used as a risk measure. But although VaR might tell you that there is, say, a 5% chance that the deficit will increase by £400m or more, it does not tell you how much worse than £400m it might be. The Tail Loss Expectation (TLE) measure reveals the average of these bad outcomes. For a corporate or trustee concerned about avoiding surprises, TLE is likely to be a better way to express this risk budget than VaR.

**EVER THE OPTIMISER** To find the optimal asset allocation for a given risk budget, a good starting point is to consider the marginal contribution of each risk factor to the total risk level, allowing for risk interrelationships ('correlations'). Some marginal risks, such as those for interest rates and inflation, can be surprisingly large considering the size of the associated expected returns (if any) over the long term. The optimal strategy will probably hedge a significant amount of these types of risks.

The traditional mean-variance optimisation method relies on risks being symmetrical. This approach breaks down when the financial instruments include asymmetric tools such as options, swaptions and principal-protected strategies. More sophisticated models are therefore required to determine the optimal strategy. Sophistication need not result in complexity if the results are communicated intelligibly.

No treasurer or trustee should slavishly trust one model or a single set of parameters. An optimal strategy under one set of assumptions might be far from optimal under another. Stress-testing is a critical part of informing the debate. Looking at a problem from multiple angles can give decision makers more confidence in the advice if the same patterns appear in the analysis.

**HEDGE OVERLAY** Simplistic models can result in bad advice. A common example is the use of stable correlation parameters. But correlations between markets change over time, and tend to spike in extreme scenarios. So just when you most need diversification to come to your rescue, the apparent correlation benefits can evaporate as markets start to move in tandem.

The use of stable correlations is one reason that some advisors have not recommended implementing liability

hedging overlays over equity allocations. However, depressed equity markets will very likely coincide with higher liability values: short-term real interest rates will probably be reduced in these environments, pulling longer-term rates lower with them. The 'flight to quality' effect has been borne out historically. Advanced modelling is not required to understand the potential benefits of a liability hedge over and above the bond allocation.

Using marginal risk analysis and optimisation helps identify the appropriate liability hedge overlay. Although a complicated overlay of 200 swaps might be theoretically correct, simpler hedge portfolios can be more transparent to implement and allow targeting of more liquid points along the curve. The trade-off of accuracy versus pragmatism can easily be measured in risk terms.

**HOW TO GET THERE** Moving from an existing asset strategy towards the chosen strategy can be daunting, and take time to implement. Decision-makers sometimes prefer phased implementation in the (often mistaken) belief that they are reducing execution risk. Quick wins in risk/return terms are valuable to a corporate. Hedging real interest rate risk often comes out as a high priority on a marginal risk analysis.

Some corporates want to reduce equity risk quickly without giving up too much upside. Equity options are an expedient way of achieving this if trustees can be persuaded to buy protection. In some cases the protection has been achieved through the corporate contributing an option into the pension scheme instead of cash.

**THE BIGGER PICTURE** From a corporate viewpoint, pension risk should ideally be optimised with reference to the other risks being run (interest rates, foreign exchange, and so on). A trustee, however, should be more concerned with optimising risk only within the scheme itself.

For example, while a retailer might believe that its pension inflation risk broadly offsets its operational inflation risk, the trustee of that retailer's scheme might want inflation protection for the scheme itself. The scheme could source inflation protection directly from the corporate (with the bank acting as intermediary), thereby benefiting from cheap supply and few execution risks.

A wide range of financial instruments can be used to reduce risk and increase returns. With careful planning and the right input,

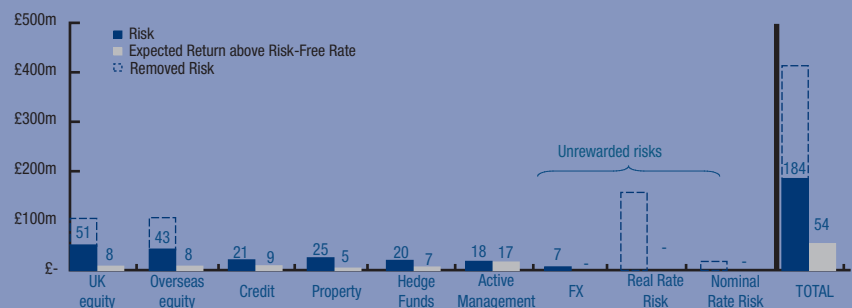
## Case study, part 2

Following negotiations between ABC plc and the pension scheme trustee, ABC agreed to inject a cash lump sum of £150m into the scheme, and fund the remaining deficit over five years. In return, the trustee agreed that a suitable objective was to adopt a risk budget equivalent to a 1 in 20 TLE of £200m (measured as the potential increase in the IAS19 deficit over one year).

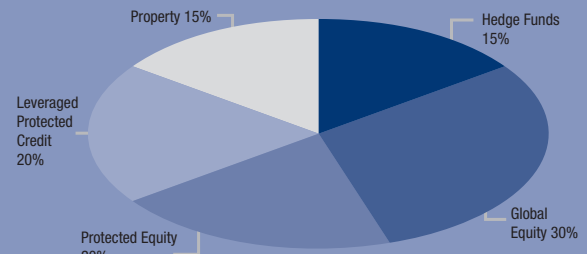
Following detailed modelling and stress-testing, the trustee decided that the asset allocation shown in the pie chart here, when combined with the interest rate and inflation hedge overlay shown in *Table 1*, would maximise the long-term expected return, given the risk budget constraint.

The pragmatic portfolio of swaps in *Table 1* was identified as hedging most of the interest rate and inflation risks:

The risk breakdown following implementation would be as follows:



Next month, we will consider the implementation issues relating to the above hedge portfolio.



**Table 1.** Portfolio of swaps

Term	Zero-coupon RPI swap notional	Zero-coupon interest rate swap notional
5 years	£290m	£430m
10 years	£545m	£509m
20 years	£664m	£554m
30 years	£480m	£362m
40 years	£220m	£156m
50 years	£65m	£42m

making best use of a risk budget need not be complicated. The challenge is to ensure that the strategy is dynamic and takes changing circumstances into account.

Our next article considers the key implementation issues.

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