SWAPS

INNOVATIVE IDEAS FOR MANAGING LIABILITIES

Liability matching strategies, once the preserve of pension schemes, are increasingly being employed by life insurance companies and other distributors

Defined benefit pension schemes and other institutional investors such as insurance companies are driven by two key objectives – to meet their liabilities in order to pay the pension benefits due to the plan beneficiaries, and to maintain or increase the surplus coming from active asset management decisions.

The traditional approach has been to concentrate entirely on asset maximisation. Only more recently, and driven by regulatory change, has the awareness for the need to specifically focus on liabilities arisen among schemes.

To match liabilities with assets is a difficult task in practice. The many simple approaches such as cash flow or duration matching offer differing risk/return trade-offs and, as such, they have their own set of advantages and disadvantages. Cash flow matching, for instance, provides low immunisation risk since cash flows of liabilities are exactly matched by cash flows generated from the portfolio's assets.

STRATEGY

However, as straightforward as this appears, the lack of availability of cash instruments and poor liquidity, particularly at the long end of the yield curve, makes it a difficult strategy to implement. This strategy also provides little room for security selection and consequently, whilst the portfolio can be immunised and liabilities matched, the delivery of attractive alpha returns is much more difficult to achieve. Other approaches, such as duration matching, have similar issues, with these strategies usually offering the potential for higher alpha generation but resulting in higher immunisation risk.

In general, the methods on offer in today's cash market fail in the primary objective to fully eliminate immunisation risk. Furthermore, cash-based strategies are always subject to the trade-off between immunisation risk and the limited potential for alpha generation.

ONE ALTERNATIVE

The problems associated with attempting to accommodate both liability matching and active management in one process has encouraged fund management groups to look for alternative solutions. One that has been gaining interest more recently is to separate the asset-liability management from active alpha generation. Using a swap overlay strategy to deal with asset-liability management, a passive portfolio can be composed of interest rate and inflation linked swaps to track the liabilities and immunise the portfolio. Traditional active management strategies are then employed to generate the alpha return, with the fund invested in asset classes that are independent of the liabilities. This provides better diversification and increased investment opportunities. In so doing, risk adjusted return can also be improved. (See Chart 1.)

Leading players have developed this analytical framework further to create an innovative modular approach to asset-liability management. In Chart 2, we can see that there are three key components to this new liability-driven strategy, each of which can be offered to pension funds either separately or as a packaged solution:

δ – Duration density matching to provide an efficient immunisation strategy (Delta)

α – Selective investment strategies to deliver alpha (Alpha)

σ – Risk management and product control (Sigma).

Each component plays a key role in ensuring the entire asset-liability strategy is performing effectively in meeting the key goals as set out by the pension fund. The following section deals with each component in more depth.

Pension institutions are particularly sensitive to

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A new approach to asset liability matching

TRADITIONAL APPROACH

Asset-liability and asset management have to be accommodated in one process

- typically achieved through mix of high grade credit/gilts
- subject to limitations of cash market

NEW APPROACH

Asset-liability management: swap overlay strategy

- the swap portfolio is managed as a passive fund with the objective of tracking the liabilities via a portfolio of interest rate and inflation linked swaps

Asset management: active alpha generation

- the manager can implement active strategies to their full extent
- the fund can be invested in asset classes that are independent of the liabilities, therefore providing better diversification and increased investment opportunities
- overall risk adjusted return is improved

'For portfolios that are purely immunised, there is generally a lack of opportunity to generate an attractive return over a long period'
Daniele Paglia, CSAM

changes in inflation and interest rates. Many traditional cash-based methods cannot adequately immunise portfolios against these two main risks. However, using a duration density model, a portfolio can be immunised against all types of curve movements. This type of analysis is capable of taking into account the impacts on cash flows from nominal interest rates and real rates as well as taking into account inflation expectations.

Furthermore, cash flows can also be analysed taking into account breakeven inflation rates, which is the gap between nominal and real return bond yields (such as inflation linked bonds) and providing a useful measure of inflation expectations. In practice, the model is used to map the liabilities as real and nominal cash flows. A synthetic overlay is then constructed such that the total cash portfolio, including all underlying subportfolios, such as the alpha overlay, is immunised against any change in real, nominal or breakeven forward rates. Importantly, this approach is also flexible enough to accommodate the inflation and interest rate components of other asset classes, such as equities and real estate.

Chart 3 provides an illustration of the general concept of duration density matching. In the first of the two charts, we can see the sensitivities to forward rates of both assets and liabilities. It shows how a cash portfolio is traditionally positioned relative to a benchmark, such as the JP Morgan EMU bond index. However, we can see that there is a large gap between the portfolio and the liabilities. In the second chart, we see that in using swaps to create a hedged portfolio, the forward sensitivities of the liabilities are matched. By swapping the interest rate exposure (beta) for delta, the portfolio can be immunised for just a small cost from the swap counterparty.

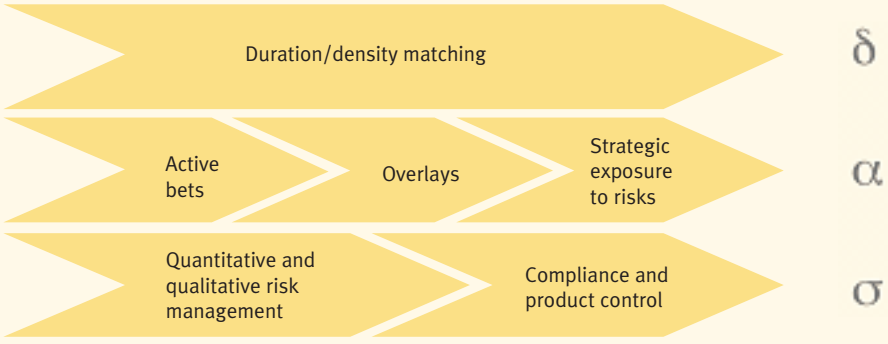
ADDING ALPHA

For portfolios that are purely immunised, there is generally a lack of opportunity to generate an attractive return over a long period. However, using this strategy to immunise the portfolio against passive interest rate risk, the available risk budget can be used to create additional sources of revenue through strategic exposure to alternative risks factors, active bets and overlays. Additional risk factors that could be used include gaining exposure to equities or credit bonds, whilst alternative investments such as hedge funds are also commonly thought of as ideal alpha generators.

Absolute return bond funds provide another alterna-

2

Components of a liability-driven strategy



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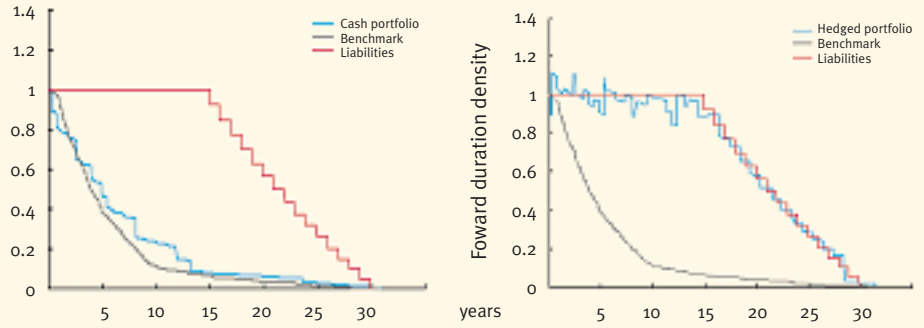
Duration density matching in practice



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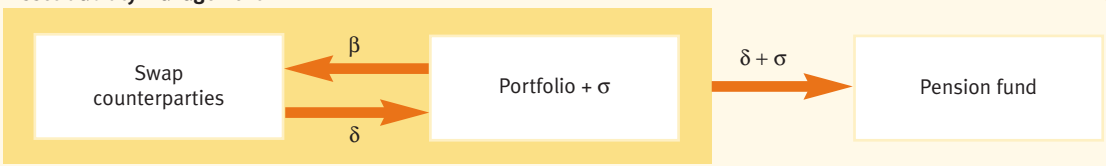
The three components working together



Source for all charts: Credit Suisse Asset Management

tive, with total return bond products such as the Target Return and TOPS concept taking advantage of low cross-correlations by investing across a wide range of fixed income asset classes.

These long-only strategies offer a range of benefits to investors that include high liquidity and an average investment grade fixed income product with exposure to higher beta asset classes. However, perhaps most importantly for pension funds, dedicated risk processes ensure the focus is always on capital preservation, downside risk control and optimum diversification in order to achieve long-term capital appreciation. Active management also opens up the possibility for life insurance companies, pension schemes and other institutions to benefit from the skill of the individual fund manager, and the generation of pure alpha.

USE OF RISK

The final key ingredient within this new liability matching strategy is the use of risk management systems to assess all risk factors. In terms of interest rate risk, sensitivity analysis for various shifts in real interest rates and inflation can be performed, as well as stress testing to ensure the entire portfolio takes into account various risk scenarios. Other risk factors can also be taken into account, such as equity or credit risk if they happen to be part of the portfolio. In terms of non-interest rate risks, the optionality of the liabilities needs to be taken into account, particularly given that liabilities tend not to be linear and there will be a need to dynamically adjust the liability hedge and reduce risk further when required. Finally, unexpected changes to liabilities is another factor that needs to be incorporated within an all-encompassing risk management system.

By combining the three components delta, alpha and sigma, a total portfolio can be constructed that can effectively match a client's liabilities as well efficiently allocate nearly all cash assets to generate an attractive alpha return. (See Chart 4.)

Importantly, this method makes more efficient use of market and active risk, with beta swapped for delta, thereby decreasing market risk and allowing the risk budget to be used for active risk taking. In so doing, the effect of interest rate changes on financing gap/surplus can be reduced or eliminated. This type of solution also has other important benefits such as providing the opportunity for best execution in liquid transactions as well as the flexibility to take into account change to liabilities.

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