

Liability Risk Management – The Basics

Liability risk has increasingly become a focus for pension schemes. A liability risk management portfolio aims to make the total assets move more closely with the liabilities of the scheme, therefore stabilising the funding level. This means a more stable contribution rate for the Sponsor, more confidence for the members and a more stable target for any plan to recoup a scheme deficit. This note provides an introduction to liability hedging, and explains how it can be used within a scheme's investment strategy to better manage liability risk.

What do we mean by risk?

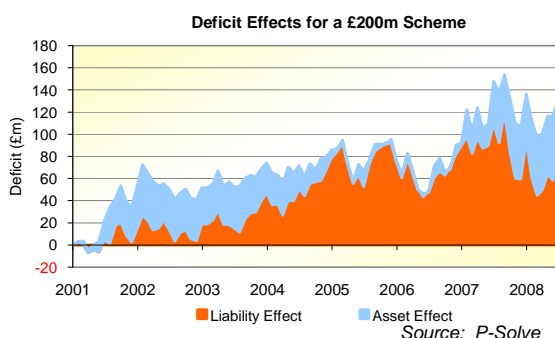
The investment strategy of a pension scheme is designed to meet one primary objective: to have enough money to pay future benefits as and when they fall due. These future pension payments are the scheme's liabilities.

The Scheme Actuary places a value on the liabilities and compares this to the value of scheme assets to calculate the funding position, which is used as a measure of how well the scheme is doing against its objective. A high funding level would generally mean that the scheme can be more confident in being able to meet its future benefit payments.

The challenge is that we are placing a value now on uncertain future payments by making assumptions about future market conditions. These assumptions include future inflation, which drives salary and pension increases, and interest rates, which are used to estimate future asset returns. As market conditions change, so do these assumptions and this means that the scheme is essentially chasing a moving target. This moving target is generally what defines pension scheme risk – a liability risk management strategy such as a liability hedge aims to reduce this risk by stabilising the movement of the assets relative to the liabilities.

Asset versus Liability risk?

Traditionally, pension schemes have focussed on asset risk (variability in the value of scheme assets caused for example by market, credit or currency risk). This can be managed through diversification, and increasingly through the use of active asset allocation and asset hedging strategies. However, changes in pension scheme deficits can be equally driven by changes in liability values. The chart below considers a scheme with liabilities of £200m in 2001 which was 100% funded, with 60% of its assets invested in equity.



In brief:

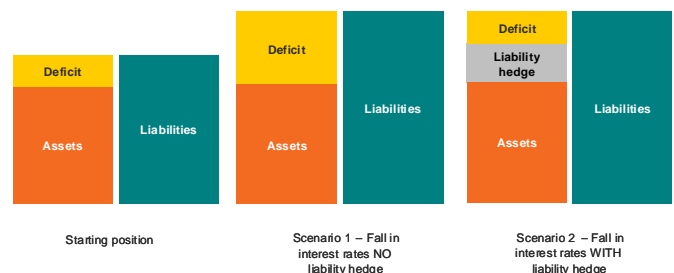
- One of the key risks faced by pension schemes is chasing a moving target – the liabilities.
- Liability hedging helps manage this risk by making the assets behave more like the liabilities.
- A liability hedge is not an “off the shelf” solution and due regard needs to be given to scheme liabilities and objectives.

This chart illustrates the historical impact of both asset and liability risk on a typical pension scheme deficit, highlighting that managing liability risk is just as important as managing asset risk.

How do we manage this risk?

Given that we can't usually change the liabilities of a pension scheme, we need to find an “asset” that moves in a similar way to the liabilities, thus allowing total scheme assets to better “match” the liabilities.

There are 3 primary factors that affect a change in the value of the liabilities (and hence things that we could try to replicate in the asset portfolio): interest rates, inflation and longevity. Products to manage longevity risk have recently been introduced to the market, but due to their more complex nature of mortality, are only slowly gaining traction. We therefore focus on managing interest rate and inflation risk through the use of “liability hedging”.



Managing Interest Rate and Inflation Risk

Historically, matching within a pension scheme's investment strategy has been achieved by investing in bonds (and in particular government bonds), given that they behave in a similar way to the liabilities for changes in interest rates and inflation. So whilst liability hedging is a more recent addition to pension scheme strategies, liability risk management itself is not a new concept.

The problem with bonds is that although they provide some interest rate and inflation exposure, they do so on a “one for one” basis i.e. investing £1 in bonds protects £1 of liabilities. Therefore, fully hedging a scheme's liabilities against interest rate and inflation risk would mean fully investing in bonds, thus tying the scheme assets up in low return generating asset classes. This would compromise the scheme's ability to meet its overall return objective and make the scheme prohibitively expensive to run.

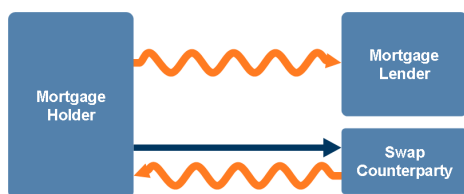
Another drawback is that you can only buy bonds with cashflows at specific maturities (and mostly at the short to medium term), but have liabilities at all maturities. This lack of flexibility means that whilst a broad match can be achieved using bonds, the level of accuracy is limited

Therefore, in practice, the extent of matching is often limited to a portion of scheme assets – the result of this is that the funding position is only part immunised against movements in interest rates and inflation.

Liability hedging uses swaps to extend liability matching across a greater proportion of scheme assets, without tying assets up in low return generating asset classes (and thus freeing up a greater proportion of assets to seek return).

What are swaps?

A swap is an agreement between two parties to exchange payments at some given date in the future. Here is a simple example: suppose a mortgage-holder has a variable rate mortgage but he would prefer to pay a fixed rate to have certainty of payments. He could arrange to swap payments with another party and agree to pay a fixed rate to this other party in exchange for receiving the variable rate that he is committed to pay on his mortgage. This allows the mortgage-holder to satisfy his objective of having known future payments whilst still allowing him to meet the payments on his variable rate loan.



This is an interest rate swap and is not too dissimilar to those used by pension schemes. Take for example a pension scheme with fixed future pension payments where the value placed on these today is determined using a fixed interest rate. The scheme needs to meet these payments by relying on assets with a variable return, and an interest rate swap can be used to swap the “cash” part of the variable return (where the assets target a return in excess of cash) for the fixed rate return (needed to match the liabilities). This better immunises the scheme from movements in the value of their liabilities as interest rates change. For schemes with inflation exposure, an inflation swap can be used in a similar way.

The key feature of swaps is that they have a zero value initially and that no capital is required to exchange hands upfront – there is therefore no need to “invest” assets in the traditional sense. Over time, the value of these swaps will change in a

similar way to the liabilities as interest rates and inflation change. This allows the scheme to continue investing a significant proportion of its assets “on risk” to seek return whilst retaining the matching properties of bonds. A portion of the scheme’s assets would however need to be made available to back changes in the market value of the swaps over time (known as collateralisation).

Overall, given that swaps are bespoke products and can be traded at any maturity with variable terms, a liability hedge (and thus liability matching) can be structured far more accurately using swaps than relying solely on bonds.

What do I need to think about before implementing a Liability Hedge?

- **A liability hedge is not an off the shelf solution** – it should be tailored to the objectives of the scheme. For example the liabilities of a pension scheme can be measured in different ways and as such a liability risk management strategy should focus on the measurement basis that is most important to the scheme.
- **Some hedging instruments may be better value than others** – the pricing of swaps and bonds changes on a daily basis, and as such, a hedge may involve a mixture of different types of swaps and bonds as market conditions change.
- **Managing residual risks** – counterparty risk can be managed with diversification and a robust collateral process. Risk of unfavourable market timing can be mitigated with a phased implementation process.

Summary

Liability hedging is a generic term for a portfolio of assets focussed on managing the risk arising from future movements in the value of the liabilities, and usually comprises a combination of bonds and swaps.

A liability risk management portfolio will increase or decrease in value over time in a similar way to the liabilities, thus better stabilising the funding position.

Using swaps is more efficient than relying solely on bonds, given that:

- it does not involve locking scheme assets up in low return generating asset, and
- swaps can match liability cashflows more accurately.

A liability hedge is not an off the shelf solution and should take into account the objectives of the stakeholders.

We would be pleased to discuss this in more detail, or to evaluate how best a liability hedging solution would work for your scheme.

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