PENSIONS

Defined benefit pension schemes - understanding the risks

There can be little doubt that the defined benefit pension scheme business is going through a bad time, with UK and Irish pension schemes still underperforming. To address this problem, going forward, pension schemes and their sponsors should establish a platform to understand, monitor and control their short-term exposure to both the assets and the liabilities writes Dawid Konotey-Ahulu.

Did they see it coming? - For the most part, no. While both pension schemes and insurance companies were well aware that the crashing equity markets of 2002 were sending their principal assets into free-fall, there was little they could do but fervently pray for a recovery, and in part those prayers have been answered. Equities are slowly consolidating and fears of a global crash have receded. However while the pain has eased, the recovery in the equities market has been fairly moderate and relief is marginal at best. A pension surplus continues to be a rare commodity and UK and Irish pension schemes still have deep holes to fill with no obvious means of doing so.

And the argument that this is a long-term game is only half the story. The other more telling half is that it's also a short- term game. Why? Because the economic reality is that the mark-to-market value of the scheme's assets and liabilities represents the true state of the pension scheme at that point in time. This is why accountants and rating agencies maintain they have not invented volatile pension scheme liabilities; they have merely drawn back the curtains.

These days fair market value is widely regarded as a synonym for transparent accounting and there is no avoiding it. The pension scheme no longer has diplomatic immunity. Credit rating agencies, equity research analysts, shareholders and the financial press all focus on the real-time pension scheme surplus or deficit as a major part of corporate analysis. If they don't like what they see in the short term, the sponsor's prospects may not be as bright in the long term.

There is much talk of swapping defined benefits for defined contributions or, in extremis, funding the scheme to some level and leaving it to fend for itself. The stark reality however is that the present value of pension scheme liabilities dwarf the cash value of the assets which back them, and nothing short of a massive injection of cash by sponsoring employers is going to make the problem go away anytime soon.

The liabilities

So if the problem is so big, the deficit so large, why did no one see it coming? Could anything have been done to

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prevent it, and is it, in fact, a real issue or does it only exist in the minds of accountants?

The answer to the first question seems to be pretty straightforward. Pension schemes didn't see it coming because they weren't looking. By way of illustration, there is a classic episode of the comedy series Only Fools and Horses in which the indomitable Trotter Removals Company is hired to dismantle a gloriously lavish cut-glass chandelier. They set themselves up directly underneath the lights. The other half of Team Trotter is installed in the room above waiting for the signal to undo the fastening bolts. Del Boy gives the signal. Down comes half a ton of chandelier. Unfortunately it's not the same chandelier as the one they're waiting to catch. It's the one on the other side of the room.

Something not dissimilar has happened to defined benefit pension schemes in the last 18 months. All eyes have been on the asset portfolio with vast teams of advisers and managers monitoring the performance of the markets, re-establishing and adjusting portfolio benchmarks and efficient frontiers. Every reversal in the equities market has been greeted with dismay, every uptick with relief. And meanwhile, something much bigger and potentially far more damaging has been happening on the other side of the room.

As long-term interest rates have declined, the fair market value of defined benefit liabilities has grown far more quickly than anyone realised it would. And since the deficit is a simple function of the difference between the value of the assets and the fair market value of the liabilities, a very big chandelier threatens to come crashing down.

The sensitivities

So what is it about defined benefit pension scheme liabilities that makes them so sensitive to changes in interest rates. First, they are very long dated. It is not uncommon for a pension scheme to have contractual liabilities payable up to 100 years from now. Statistically there is a chance that an active member currently aged 18 for example, will marry a 25 year old in 50 years time and then die. That spouse might be entitled to a defined pension benefit for many years after that. Secondly, the scheme's liabilities tend to be 'zero coupon' in nature. That means the 'weight' of the scheme's liabilities tend to be cashflows payable far in the future.

Duration

The result is that most defined benefit pension schemes in effect have large, long-dated zero-coupon liabilities the present (or fair market) value of which is highly sensitive to movements in long term interest rates. For example, a typical pension scheme with, say, £500 million of liabilities today, probably has an interest rate sensitivity of more than £1m per basis point. That is to say, if the yield curve shifts down one basis point, the liabilities will increase by £1m - all other factors remaining constant. To put it another way, they have very high duration.

Negative convexity

But that's not all. Long-dated zero-coupon liabilities are also very 'negatively convex'. This is a particularly unfortunate property and it is one of the principal reasons pension schemes have only recently discovered that their deficits have not improved despite a moderately decent recovery in the equity markets. By way of explanation, it helps to think of interest rate risk as comprising two additive properties - duration and convexity. Duration risk is directional - if interest rates rise the liabilities fall linearly. If interest rates fall, the liabilities rise linearly.

Negative convexity doesn't care about the direction of the interest rate movement. It has an additive negative effect that becomes increasingly pronounced the further the interest rate move, irrespective of the direction of that movement. So, as interest rates rise, the beneficial effect upon the size of the liabilities gets smaller and smaller. And as interest rates fall, the adverse effect upon the size of the liabilities gets greater and greater.

And that is exactly what has happened over the last 18 months. As well as a decline in the equity markets, there has been a major fall in long-term nominal interest rates (120 bp over the last 36 months in long term UK rates for example); and the further they have fallen, the faster the liabilities have increased. (For a defined benefit pension scheme with duration 23 years, the interest rate sensitivity almost triples for a three percent fall in interest rates). A linkage to inflation (either through wages or as a direct term of the benefits) means there is also generally significant exposure to changes in long-term inflation expectations.

In Ireland, the problem has been compounded further. Not only have interest rates fallen, but inflation expectations have risen. Rates can't be increased unilaterally by the Irish government and pension schemes have taken a severe double hit - one from falling interest rates and the other from rising inflation.

Many finance directors in both the UK and Ireland have had to post huge increases in the size of their FRS 17 deficits, not just because the assets in the pension scheme have fallen, but also because the liabilities have risen more quickly than expected.

Key questions

This is the heart of the problem. Few defined benefit pension schemes have been through a rigorous Asset / Liability Analysis ('ALM') which breaks down the liabilities into their basic risk components. In order to do so it is essential to model the pension scheme's accrued liabilities in detail and then to scenario / stress test them extensively. The results are often surprisingly counter-intuitive. For example, it is not immediately obvious that liabilities due to middle aged active members (40 - 49 yrs) are often much more sensitive to adverse market movements than those due to pensioners aged 60 and over.

A rigorous and comprehensive ALM exercise will not only serve to highlight pockets of serious risk and but should suggest appropriate hedging strategies to mitigate that risk.

Here are some basic, but nonetheless key questions that will illustrate the real level of familiarity with a scheme's assets and liabilities:

- If the yield curve moves by 0.01 per cent how much will the total scheme liabilities move, all other factors remaining constant?
- If the yield curve moves by 1 per cent, the liabilities will not move by 100 times the answer to a) above, since they are negatively convex. How much will they move?
- To the nearest £1m, how much will the liabilities move, if long-term inflation expectations rise or fall by 1 per cent?
- Which class of scheme member (active, deferred or pensioner) and which age group is currently most sensitive to adverse movements in interest rates and inflation expectations, and by how much?
- Does the scheme's current asset allocation mitigate the risks outlined above, and if so by how much?
- Given a 50bp fall in interest rates and an accompanying 50bp rise in inflation expectations over the next 18 months, roughly how much will the scheme's surplus / deficit change?

The strategy

Once the scale and quantum of risk is fully identified, the scheme and the sponsor employer are in a position to address how best to mitigate it. There are no quick fixes. And the answer to this particular problem does not lie in a wholesale move into bonds. Long dated, highly rated fixed rate bonds tend to be expensive and rare. And if the scheme is in deficit it won't have the cash to buy them. Furthermore if the equity market rises, the scheme will miss out.

So what prudent actions may a scheme take? It can start by carrying out a rigorous profiling of its asset and liabilities - with as much attention paid to analysis of the liabilities as to the assets. The better the scheme's understanding of the behavioral characteristics of its liabilities, the better placed it will be to accurately target and manage its risk profile.

And any such analysis will highlight the nature and magnitude of risk currently being run in the pension scheme. Usually this will be several times greater than the risk that the sponsoring employer would be prepared to run in its own Treasury operation. This is relevant, because the risk within the pension scheme is de facto ultimately the risk of the sponsoring employer. And if, as anticipated, IAS 19 does take FRS 17 one step further, it is likely that movement in the deficit will have to be reflected somewhere in the sponsor's income statement.

From the perspective of the pension scheme trustees things aren't much better. The fact that the scheme in effect has a 'call upon the cash of the sponsoring corporate' to make good the deficit, means that it is sensible for the scheme to categorize the deficit as an asset within the portfolio. The deficit is, in effect, self-investment in the employer. But this 'asset' has several undesirable features - it is particularly sensitive to certain market movements, its risk return characteristics are questionable and it is undoubtedly not one the scheme would have been permitted to acquire in the normal course of business.

So what is the way forward? The answer lies in the analysis. Once the risks have been identified and quantified, the scheme trustees and the employer will be in the advantageous position of being able to strip out (hedge) risks that have undesirable volatility / return features and which are typically asymmetric. They can leave intact those features that the scheme does want - which may include equities, property or other asset classes.

The world has changed. Assets are now benchmarked against the liabilities. It isn't a matter of choice nor is it just an accounting issue. Going forward, pension schemes and their sponsors should establish a platform to understand, monitor and control their short-term exposure to both the assets and the liabilities. Or they can trust to luck and a fair wind. If history is any guide to the future, it is the former approach that will ensure their success in the long-term.

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