

BUSINESS

Actuaries and the pensions crunch

When the spinning stops

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Can actuaries help to sort out the mess in corporate pensions?

AMONG the many jokes about actuaries, one cruelly hits the mark. An actuary and a farmer are looking at two fields of sheep. The farmer asks the actuary how many sheep he thinks there are: "1,007", is the quick and confident reply. The astounded farmer asks how the actuary reached that number. "Easy, there are seven sheep in that field and about 1,000 in the other."

False precision and reckless approximation have defined the actuarial profession's role in the crisis that has enveloped corporate pensions on both sides of the Atlantic. Although actuaries have not been the only cause—companies, trustee boards, governments and accounting rules have all played their part—they have been surprisingly hapless at their main task: forecasting funds' future liabilities and assessing how many assets will be required to meet them.

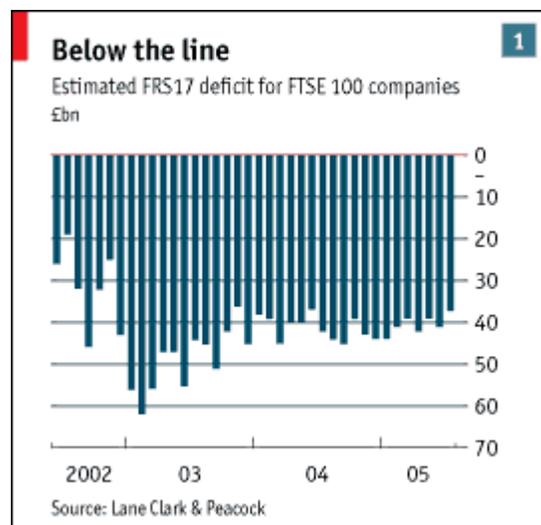
Their failure has hastened the collapse of final-salary (defined-benefit) pension schemes, many of which have ballooning financial deficits. In Britain 70% of such funds have been closed to new entrants in the past few years. Recently, led by IBM in America and Rentokil in Britain, companies have gone further and begun to close schemes to further accruals. As a profession, actuaries stand accused of negligence on a grand scale.

This is truest in Britain, which is where the pensions mess is most acute—and is also where actuaries are laying a path for their colleagues in America and continental Europe on how to put their mistakes right. Since the mid-1990s, the profession has completely recast its ideas and practices, such that Britain is arguably now the world's most sophisticated forum on how to price long-term financial promises and guarantees. This is doubly ironic. First, British actuaries failed disastrously in their reckoning of these issues during the 1980s and 1990s. Second, many of these ideas came from academic work in America, where the application of modern finance theory to companies and their balance sheets flourished from around 1970.

America has fallen behind mainly because its corporate pensions crisis, though grave, is less severe than Britain's. Fewer retirement benefits there rise in line with inflation, meaning that they are much less expensive in the long run. Only in a few extreme cases (such as General Motors) is the solvency of a big company at risk because of pension liabilities. Further, the pensions industry in America is a shared endeavour, shaped by rules and accounting regulations as well as actuarial practice.

Most members of retirement schemes have little idea of what actuaries do. In essence, they make forecasts across the many variables that affect pension funds. These include not only big factors such as inflation, interest rates, rates of return on assets and how long people will live, but also a host of other more technical things, too. Every three years or so, its actuary calculates whether a fund is in surplus and how its balance has changed since the previous exercise. Pension-fund trustees and sponsoring companies then try to agree on the appropriate level of ongoing funding.

Such “multivariate” forecasting is notoriously difficult—far more so than, for example, guessing the future growth of an economy's GDP. In actuarial exercises, the right question to ask is not whether the overall forecast will be wrong, but by how much it will be wrong. But until the mid-1990s, few people asked this of their actuaries, who tended to act as if they were infallible even while their forecasts were going spectacularly awry. A set of orthodoxies suited the cosy corporate culture of that earlier period, when actuaries endorsed the idea that funds were in healthy surplus, and trustee boards were toothless and saw no need to argue with companies. Most pension schemes held 80% or 90% of their assets in equities, which rose strongly in an inflationary era. Accounting conventions allowed companies to post “profits” derived from the future expected returns on these equities. Although they were not directly responsible, most actuaries were happy to endorse this.



Many companies also used surpluses to justify lengthy “contribution holidays”, meaning the scheme's actuaries agreed that there was no need to put fresh money into their funds. Before the arrival of a robust mark-to-market culture during the

1990s, actuaries were happy to smooth equity values by not writing them down during tough markets and understating them during bull markets (a habit that goes back at least as far as the 1974 stockmarket wobble in Britain, when a collapse in pension assets was overcome by actuarial fiat). They also endorsed the bizarre practice of assuming that holding equities magically reduced a fund's net liabilities, which meant that the sponsoring company could justify lower contributions.

In hindsight—and not just actuaries were slow to spot the role of inflation in allowing it—this was a perverse way to run a pension industry. First, pension funds held assets that, despite outperformance during a period of robust inflation, proved a poor and risky long-term match for liabilities that are bond-like in that they span many years and require reasonably predictable cashflows. Second, by embracing the idea that high returns from equities would lead to lower net liabilities, actuaries set the scene for an overall level of funding that left many schemes vulnerable when equity markets crashed, as they did in 2000-03. In Britain some actuaries went so far as to allow sponsoring companies to assume unusually high returns on their assets, making funds appear healthy when they were in fact in poor shape.

Some of these orthodoxies have been overturned in recent years. Martin Taylor, chairman of the trustee board of WH Smith, a British retailer, has described the actuarial convention that the composition of the assets should determine the size of the liabilities as “one of the weirdest emanations of the human mind. It's a metaphor—like saying that the advent of jet planes made the Atlantic narrower—and metaphor has limited place in finance.” Plenty of actuaries now agree.

Indeed, the most radical attack on actuaries came from within the profession itself. A defining moment was the presentation to Britain's Institute of Actuaries in 1997 of a paper by Jon Exley, Shyam Mehta and Andrew Smith. In “The financial theory of defined benefit schemes”, they systematically analysed pension funds as part of overall corporate finance theory. Their arguments, which drew on earlier work by academics such as Zvi Bodie of the Boston University School of Management in America, laid the foundations for a completely new actuarial school.



New wares to peddle

According to the new thinking:

- A pension fund should be seen as part of the sponsoring company's balance sheet and risk profile.

- Because funds have tax privileges, shareholders have an interest in wanting them to be fully funded, indeed in modest surplus, so as to maximise that benefit.
- When a company has a pension scheme and accrues liabilities to it, it is in effect issuing long-dated index-linked bonds.
- Assets are worth what the market will pay for them, so £100 worth of equities is worth no more than £100 of bonds.
- The natural assets for a pension scheme are deferred annuities.

One of the strongest arguments made by the new actuaries was to debunk the idea that holding equities somehow reduced a fund's liabilities. They used a simple analogy to show how nonsensical the original thinking had been. Imagine you borrow £1,000 from the bank (ie, a liability) and invest it in equities (ie, assets). Do you owe any less to the bank as a result? Further, do you think you could persuade the bank manager to allow you to make smaller or slower repayments on the grounds that your equities will produce returns in future that will make up the difference? Of course not, said the new actuaries. What a fund does with its assets has obvious consequences, they pointed out, but these do not include altering the value of its liabilities.

To the layman or to observers versed in finance, these ideas might seem obvious. But for actuaries they represented an entirely new way of thinking about pensions. Initial resistance to the new school crumbled amid tumbling equity markets after 2000. Supposedly healthy pension schemes suddenly had huge deficits, not just as a result of lower share prices, but also because falling real interest rates pushed up the net present value (but not the long-term costs) of their liabilities. Something had clearly been wrong with the actuarial status quo, and that opened the way for advice from a new generation of actuaries.

Lane Clark & Peacock (LCP), a firm of British actuaries, conducts an annual survey of the pension schemes of the biggest British companies. Ninety-two of the top 100 companies that make up the FTSE-100 share index have defined-benefit schemes, and these have mostly lurched into deficit in recent years (see chart one). New pension-fund accounting and valuation rules, known in Britain as FRS17, mean that these deficits are more comparable than they were. The headline deficit of £37 billion in July 2005 represents five months' worth of the companies' pre-tax 2004 profits, a year's worth of dividends, or 3% of the FTSE-100's market value. But LCP argues that the figure is not equivalent to the full extent of the challenge facing companies—add other factors and the total deficit might be as much as one-quarter bigger.

The reason why the reported FRS17 numbers could be much too small may, though, be another case of false precision. If a company tried to walk away from its pension liabilities then it must top up the assets so that the accrued benefits can be fully met by purchasing the appropriate annuities from an insurance company. Just now, this is an expensive option: if all the FTSE-100 companies with deficits went down this route, the shortfall would be nearer £150 billion. A recent estimate by Mercer, another firm of actuaries, put the buy-out costs at twice that—though the new school of actuaries would be the first to point out that this is just a snapshot. If real interest rates were to rise, then annuities would become cheaper and the cost of winding up a scheme would fall.

Actuaries, along with the rest of the pensions industry, have also been surprised by an unprecedented increase in the longevity of pension schemes' members, particularly of a cohort that is now in its 60s and 70s. Obviously the longer people live, the longer they will draw pensions, so this is a critical variable for schemes (as well as for governments trying to finance social-security systems). Greater longevity has also had another, more subtle, effect on pension schemes, because it has led insurers to model more carefully how long people might live and hence to charge a more accurate (ie, higher) price on the long-dated life policies and annuities they offer.

With such an array of pension problems, no wonder many companies developed an aversion to defined benefits. According to Britain's National Association of Pension Funds (NAPF), by mid-2005 about 70% of defined-benefit schemes had been closed to new members; some 9% had been closed to further accruals by members (a trend that has accelerated). Christine Farnish, the NAPF's chief executive, has said that she expects defined benefits to disappear from the private sector within five years.

The deterioration of a once flourishing sector led to political intervention and the introduction of a regulatory framework designed to shepherd pension schemes to safety. This includes a new Pension Protection Fund modelled loosely on America's Pension Benefit Guaranty Corporation. In its first full year it will levy £575m from Britain's pension schemes, as it begins to phase in risk-adjusted premiums that call on healthier funds to pay less than creaking ones. A Pensions Regulator has also given more powers to trustee boards to claw back deficits from scheme sponsors over shorter periods, or to ask for security over other assets such as properties.

That is one of several trends embraced by actuaries that have gradually encouraged pension schemes to become more conservative in the assumptions they make and the assets they hold. One landmark was the decision in 2000-01 by Boots, a retailer, to switch all of its £2.3 billion of assets into a portfolio of long-dated cashflow-matching bonds and to make a linked share buyback that benefited shareholders. The deal, which proved well-timed and has since had some imitators, was deemed so radical at the time that many actuaries balked at suggesting anything similar to other clients. Coming near the peak in share prices, it was dismissed by many companies as merely a trading strategy. In fact, the deal came after years of internal debate, between Boots' managers and their financial advisers, pension-fund trustees and, yes, actuaries, about how to apply new actuarial ideas.

Many schemes have since been lowering their exposure to equities, investing more in property, private equity, hedge funds and commodities, as well as buying more bonds. At the heart of this trend is a concept known in the pensions business as "de-risking". At present this is being touted as effectively by investment banks eager for fees as it is by actuaries. The banks see an opportunity to use their financial-engineering expertise to create structured portfolios of assets that are suited to pension schemes' future cashflows. They point out that even though equities have performed well since the end of 2002, funds' health has worsened. The reason is that liabilities have grown even faster than assets. (The accusation that actuaries failed to warn of the growth in liabilities is implicit.)

The solution, argue the banks, is to look more closely at the risks embedded in liabilities and then to reduce funds' riskiness with "Liability Driven Investing" (LDI). The big financial risks relate to inflation and interest rates, while the biggest non-

financial risk is changes in longevity. Using derivatives and swaps, the financial risks can be largely stripped out (for a fee, of course) so that funds can be much more certain about their ability to meet future cashflow requirements.

Two LDI pioneers have shown what is possible. Friends Provident, a life insurer, implemented a hedging programme with Merrill Lynch in late 2003. In September 2005 the pension-fund trustees of WH Smith sold all of the £870m (\$1.6 billion) fund's assets and invested 94% of the proceeds in a portfolio of interest-rate and inflation swaps, with the balance invested in equity options designed to capture returns from shares over the next decade or so. The company was persuaded to embrace the plan when its advisers explained that the level of risk in the pension fund was so high that the group's solvency could be at stake if things deteriorated.

It is too expensive to reduce long-term risks entirely, so the idea behind LDI is to focus on the big risks and narrow the range of possible future outcomes, limiting the bad ones. LDI is a bit like a hedging programme that zaps the negative effects of interest-rate and inflation risk. There is a range of LDI strategies and structures. In a sense, Boots implemented an LDI programme, but one using bonds rather than snazzier derivatives.

A long squeeze

One problem with LDI is the constraints on the supply of the instruments it uses, particularly when a pension scheme needs to stretch at least 50 years into the future (which is the limit of long-term swaps and bonds). Last year Merrill Lynch pointed out, for example, that Britain has some £700 billion of defined-benefit liabilities, but a mere £7 billion of 35-year index-linked (ie, inflation-proofed) government bonds. As more funds switch their attention to reducing risks, these supply constraints are likely to worsen. In a recent technical squeeze in the market for 50-year gilts, prices have risen so high that real yields have collapsed to historically low levels. This week, for example, the latest auction of 50-year bonds was oversubscribed and offered a real yield of just 0.46%. Demand is coming from pension funds (and insurance companies) looking for very long-dated investments, but also from investment banks seeking to hedge their own LDI-related trading books.

LDI springs from the new actuarial thinking in that it puts the risks in a pension scheme in the context of the sponsoring company's overall risk profile. But actuaries have begun to point out that LDI is not the answer for every fund. Those with financially strong sponsors, or with sponsors prepared to give pledges or guarantees to their funds, might have no need for a transaction that can be expensive. Moreover, a fund that locks in security at today's high bond prices might come to regret it a decade hence if real interest rates revert to their long-run historical levels.

Even so, the insight that pension schemes need more security is becoming well established in Britain and in America. Ultimately, the old actuaries failed because they did not properly anticipate, calculate and communicate the rising costs of retirement provisions, especially once inflation slowed and real interest rates fell from the mid-1990s onwards. The promise of the new actuaries is that, as their ideas spread, such mispricing will never happen again. If that has come too late for many

defined-benefit schemes, at least it might offer a bit more certainty when planning for the next generation's old age.