Special Report Longevity

A role for the state

David Blake explained his views on longevity bonds to Brendan Maton

It seems strange for anyone familiar with pension economics to want national treasuries to take on more longevity risk. The whole point of greater funded occupational pension coverage is to alleviate the taxpayer's burden.

Everyone from the OECD to the European Federation for Retirement Provision has banged the drum for more funding since the early 1990s. And everyone knows that as people are living longer and longer, it is still more imperative for people to save for old age rather than rely on state benefits.

Professor David Blake, director of the Pensions Institute at London's Cass Business School, nonetheless, has spent the past seven years on and off trying to persuade the UK Treasury in Whitehall to issue longevity bonds.

Is he mad? Judging by the absence of any such sovereign longevity bonds, one might think yes. A glance at the risk already on government books only seems to confirm the point. Of the pension liabilities already in payment at the end of 2003, the British state was liable for £460bn (€550bn). On top of this, add £190bn for unfunded civil servants' pensions. Now look to the retirement costs of those currently working for the government, plus state pensions for all current workers; the sum is a further £960bn. Given the recent revision of UK longevity (these figures are based on end-2003 projections), it is thus safe to assume the UK government has in excess of £1.7trn to pay out.

Few other European governments are better off. So why would any of them issue a type of bond that exposed it to even more pension risk?

Blake's argument – and it is one shared by influential insurance experts such as Tom Boardman, director of policy development at the UK's largest annuity provider, Prudential – is that were governments to issue longevity bonds covering those aged over 90, then a reference point would be established for commercial players to mark out a longevity curve for lower ages, eg 65-89. In this respect, the bonds' principal function would be similar to that of nominal and index-linked state paper, namely offering accepted risk-free benchmarks from which commercial players could price their own issuances and gauge risk. Once risk can be measured satisfactorily, then investment banks would galvanise their clients, liquidity appears and trading ensues. Beautiful – if either party still exists after the credit crunch.

It is worth pointing out Blake's credentials: he proposed the original design for a longevity bond that the European Investment Bank (EIB) and BNP Paribas attempted to bring to market in late 2004; he is co-founder with JP Morgan of the LifeMetrics longevity indices; and he is a co-inventor of the Cairns-Blake-Dowd stochastic mortality model.

But this does not answer the question of what benefit governments receive from nurturing such a market. Blake replies that longevity bonds could be a real answer to a pressing predicament. "The UK government needs to issue about £90bn in debt this year [having injected extraordinary amounts into saving the British banking system]. Longevity bonds could form an attractive part of that deal, since there would be high demand for such bonds from annuity providers and pension funds and the government could command an attractive risk premium," he says.

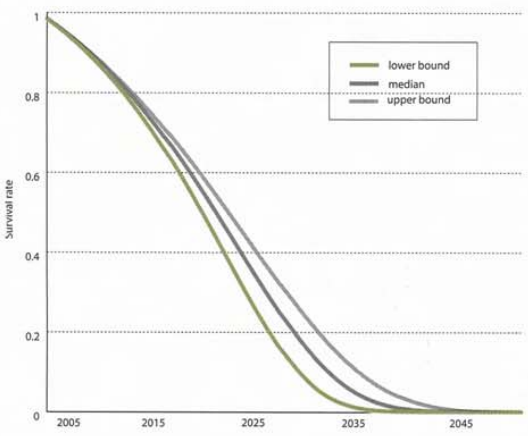
A long, healthy retirement means costs for pension sponsors

In fact, trading longevity does not need government participation. Blake's seven-year dialogue with the UK Treasury is evidence of his enthusiasm. But there have already been at least three major private-sector longevity transactions. In April 2007, Swiss Re acquired the longevity risk of 78,000 pension annuity contracts written by Friends Provident between 2001 and 2006. This was the first ever longevity swap (although written under an insurance contract, rather than a capital market transaction). Since then, Canada Life acquired the £4bn closed annuity book of troubled pension provider Equitable Life; and JP Morgan in January last year engineered a derivative solution – using a q-forward contract – for the longevity risk held by Lucida.

Lucida, one of the new breed of buy-out providers in the UK market, is perhaps the most interesting for pension funds because, in Blake's eyes, it shows up where the unwanted risk of longevity is being tackled most keenly. Buy-out providers have successfully entered the British defined benefit market. Based on estimates from Aon Consulting, about £9bn in DB assets have been transferred.

Blake's elegant contention, however, is that these buy-out providers cannot carry on winning new business without inevitably hitting

Survivor fan chart for 65-year-old English and Welsh men



Source: Blake et al (2008)

a shareholder capacity constraint. He sees them reducing that imbalance by offloading unwanted risk. And given that their clients tend to be mature schemes, longevity is their greatest unwanted risk.

"The way these insurers think about it is that they can take on £8-12 in assets for every £1 of capital, according to their individual capital adequacy agreement with the regulator. It's probably nearer £8 in current markets. They are coming up against their own equity capacity," he says.

So Lucida offloaded longevity risk, at a price. But in spite of the trio of deals highlighted here, Blake admits the nascent market requires more communication and understanding; not just with would-be sellers such as pension funds and buy-out insurers, but also would-be buyers, such as hedge funds, insurance-linked securities investors, sovereign wealth funds and endowments.

He is willing to listen, after the failure of the EIB bond to generate sufficient investor demand back in 2004. "No one feels this more keenly than I do," he admits. For a man whose doctorate was gained in modelling pension fund investment behaviour, the professional embarrassment is understandable. Lack of consultation was one cause of failure; the support of neither target pension funds themselves nor influential advisers was secured prior to launch. Another flaw was that the fund was offering protection on the lives of UK males starting from age 65. As Blake writes in a new paper on the topic: "While this might provide a reasonable hedge for male plan members in their 60s, plans also have male members in their 70s and 80s as well as female members."

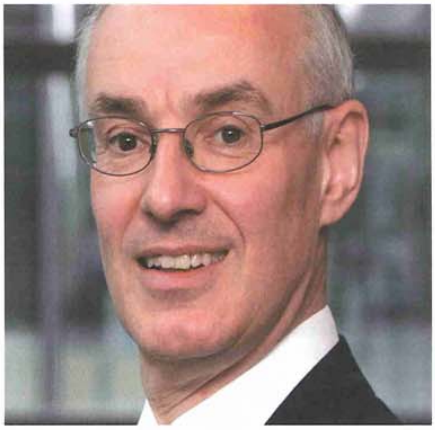
Face-to-face he is even more direct: pension funds don't really need a hedge at age 65. Greater uncertainty comes with older members, which takes us back towards the 'toxic tail' of over-90s for which Blake et al. would like to see the government play some role (see survivor fan chart for 65-year old English and Welsh men below left). The actuarial maxim might be: the longer you live, the longer you can expect to live.

How will the market grow?

Blake is confident that pension funds and insurance companies will eventually become involved, just as they have become familiar with interest and inflation-rate swaps which were hitherto part of a foreign language. Guy Coughlan of JP Morgan believes that a liquid, hedge-effective market could be built around just eight age-bucketed derivative contracts, which resemble the 'buckets' offered to pension funds in popular LDI products designed to lower interest rate risk.

Nevertheless, as sellers of longevity risk, pension funds still prefer the risk bundled up in an insurance contract with the buy-out specialists. So it will likely be these authorised insurers who follow Lucida's lead in offloading risk and so increase demand on that side of the market.

Ironically, however, some pension funds are already buyers of longevity risk, ie, they sit on the other side of trade. The Dutch metalworkers fund, PME, is among this number. At the end of 2007 it held $400m (€300m) in life settlements, a mostly US-sourced market that sees life policies bundled into special purpose vehicles and sold in the capital markets. The original sellers tend to be the wealthy elderly who trade in unwanted life assurance policies;



"Longevity bonds could form an attractive part of that deal, since there would be high demand for such bonds from annuity providers and pension funds"

David Blake

the ultimate buyers, like PME, look to profit from buying at a lower price than the policy is actually worth. Bluntly speaking, buyers are betting that the individuals will die sooner rather than later. (Note that this kind of actuarial computation is conducted by third-party experts on behalf of pension funds. Investment banks and asset managers have rapidly moved into providing the service.) While such packages might not be expected to sell well in the current, fearful climate, Blake counters that longevity risk is uncorrelated with financial market risk and hence forms the basis of a potentially important new diversifying asset class.

London-based boutique MPL, for example, announced a net return of 10.22% on its Traded Policies fund for 2008 to 15 October 2008. Such returns illustrate why it is not nonsensical for retirement schemes carrying longevity risk to acquire more. Longevity varies not merely from country to country but within countries themselves: it is not a like a noble element that remains immutable in society. Blake points to the regional differences in the US as a prime example of variation.

And so, the capital market in longevity is already born. Retirement funds play on both sides of this market. But in terms of liquidity, there is still some years to go before significant trading flows materialise.

Hedging in practice

The focus of liability driven strategies has so far largely been on interest rate and inflation risk. Solutions to longevity risk have been slow both in creation and take-up, finds Nina Röhrbein

With life expectancy constantly improving throughout the world, defined benefit (DB) pension funds increasingly find themselves struggling to forecast their member's life expectancy and calculate that risk to be able to fulfil the future payments.

But although this is a global phenomenon, the large majority of solutions to longevity risk are currently only available in the UK. However, they are set to gradually move beyond the existing borders. At the moment, in terms of products, the market in Britain is split in two directions.

"We would not be surprised to see a trade taking place during the first half of 2009"

Jerome Melcer

"On the one hand, we have the traditional insurance products like buy-outs and buy-ins," says Guy Coughlan, managing director and global head of pension asset liability management at JP Morgan. "On the other hand there are the newer capital markets products which look purely at the longevity risk. They can be either customised to the particular mortality profile of pension fund members or be index-based."

"Buy-outs take all the longevity risk off the table as far as trustees or companies are concerned," says Jerome Melcer, partner at Lane, Clark & Peacock (LCP). "But in doing this they bundle their longevity risk together with financial risks & hand it over to the insurer, together with a large chunk of pension assets."

One form of longevity hedge is the customised longevity swap. For this, the pension scheme enters an agreement with another party, such as an insurance company or an investment bank. The pension scheme pays an agreed set of payments to the provider while the provider pays the actual pension payments due.

"If a scheme enters into such a longevity swap it effectively is completely protected against the longevity risk of its members," says Melcer. "But customised swaps are normally only available for pensioner members."

The index-based swap takes the view ▸

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that if the general population of the UK lives another year longer than expected then the pension fund members will on average also live a year longer than expected.

"The gamble is that the scheme members reflect the longevity of the general population, which may or may not turn out to be the case," explains Melcer. "It is not a complete hedge but may be of interest to schemes that either cannot afford a customised swap or for smaller schemes where a customised swap may not be available."

But despite these solutions the current longevity market in the UK is still nowhere near a liquid market. And as the transactional part of the market is still very small, a preference for one or the other solution has yet to emerge.

"The examples that we have done in the public domain indicate that hedgers are willing to do each of these alternatives, depending on their situation," says Coughlan.

Recent market developments have taken place in both areas. JP Morgan launched its tradable longevity index – called the LifeMetrics index – in spring 2007. It was designed to enable pension funds to measure and hedge the risk associated with their beneficiaries by incorporating statistics on mortality rates and life expectancy across genders, ages and nationalities. So far, indices have been created for the US, England and Wales, Germany and the Netherlands.

Second, UBS Global Asset Management has just entered the UK market with a phased buy-out product with the insurer Aegon. This product is designed to allow pension plans to split their plan membership into various elements and then buy them out in the future as and when the moment is right.

But capital market solutions can have advantages over insurance solutions. "They offer a broader set of potential counterparties, as the counterparties are no longer restricted to the insurance industry," says Coughlan. "There is a lot more liquidity and pricing transparency. And all derivatives that are transacted are fully collateralised, which means their credit counter-party risk is minimised."

So far all the longevity products that have transacted have been derivatives, not securities or bonds, according to Coughlan. "Longevity risk does not emerge until after quite a long period, which makes the amount of return on an initial capital investment in a bond quite low," he says. "Taking a derivative format gives typical longevity investors such as hedge funds an expected return that is more in line with their objectives."

One key advantage of a longevity swap, compared with a buy-in, is that trustees retain control over scheme assets. "In an environment where trustees are increasingly focussing on counterparty risks, a swap is therefore a new tool that allows them to deal with longevity risk, but still diversify scheme assets," says Melcer.

However, the figures for 2008 show a different direction in the longevity market. "We estimate that the buy-out market for 2008 as a whole was around the £8bn (€8.9bn) mark," says Melcer. "In terms of the market for longevity hedging, although there have been trades between investment banks and insurers, we are not aware of a longevity trade by a pension scheme."

But the buy-out market has now stalled to some degree, according to Coughlan. "Asset values have fallen and insurers that do the buy-outs have access to less capital than they would have had in the past," he explains. "In turn that has increased the pricing that is needed to cover the buy-out liability."

"As few people are willing to take longevity risk in its pure form, capacity is limited," adds John Fitzpatrick, partner at the Pension Corporation, a UK insurer specialised in acquiring pension obligations. "And with more pension funds using longevity insurance, prices will rise." Pension Corporation offers full and partial buy-outs as well as longevity insurance to pension funds.

Both partial and full buy-outs took place in quite significant numbers in 2008, according to Fitzpatrick. But in the current climate many pension fund trustees will focus on partial buy-outs of pensioners as something they can afford, he believes. "However, the buy-out market will continue to benefit from sponsors looking to de-risk their balance sheets," he adds. "Trustees will look to longevity insurance to protect themselves while they invest their assets to achieve their targeted funding level. When pension funds get their funding up to a full buy-out level I believe they will execute a full buy-out."

"If they have got members' security in mind trustees may still be looking at it but the final approach adopted really depends on the individual case requirements," adds Ritesh Bamania, head of asset liability investment solutions UK at UBS.

"In our phased buy-out product Aegon guarantees the longevity basis it would use on pricing for seven years, which effectively removes longevity risk over this period. If pension schemes carry out a buyout within those seven years they can apply this locked basis. In other words, pension funds set in place a process where they buy out pre-determined elements of their plan as and when the funding ratio improves using the locked-in mortality basis."

"We have already witnessed a significant increase in interest for this offering, which we did not see in early 2008," says Bamania. "Underfunding has increased so much that unless sponsors are capable of making significant cash injections – which may be very difficult in the current climate – we are confident phased buy-outs will remain on the agenda over the next 12 months."

"Unless the stock market recovers dramatically there will be increased demand for partial buy-outs and other ways of hedging such as

Buy-ins and buy-outs

- In both buy-ins and buy-outs, UK pension fund trustees pay a premium to a Financial Services Authority (FSA)-regulated insurance company in exchange for bulk annuity contracts that guarantee to pay a set of defined benefits to the pensioners.
- In a buy-out, the trustees fully discharge their liabilities, while the pension scheme ultimately winds up and individual members receive an annuity policy from the insurer. Apart from undertaking a full buy-out, pension funds can also agree a partial buy-out, for example for the pensioner members only. In the event of insurer insolvency following a buy-out the members are protected by the Financial Services Compensation Scheme (FSCS).
- A buy-in is an asset of the scheme, with the trustees owning the bulk annuity policy and the beneficiaries remaining members of the pension scheme.
- The number of buy-out providers in the UK has grown sharply over the past couple of years. It has moved from the initial two big insurers Legal & General and Prudential to include players such as Aegon, AIG, Lucida, Met Life, Norwich Union, Paternoster, Pension Insurance Corporation, Rothesay Life (owned by Goldman Sachs) and Swiss Re.

Capital market products

- Capital market products, as opposed to insurance solutions such as buy-ins or buy-outs, look at longevity risk only. They can either be customised to the particular mortality profile of pension fund members or be index-based.
- For a customised longevity swap, the pension scheme enters an agreement with another party, such as an insurance company or an investment bank. It pays an agreed set of payments to the provider, while the provider pays the actual future pension payments due.
- The index-based swap is based on a generic index. It assumes that if the life expectancy of a country's general population increases by a number of years, the life expectancy by the members of the pension fund will increase accordingly.

Transactions and trades

- The first public announcement of a transaction on the LifeMetrics index in the UK was the one by UK insurer and pensions buyout company Lucida in February 2008. So far a handful of transactions have taken place on the index.
- In terms of longevity hedging, trades have taken place between insurers and investment banks. However, the first longevity swap trade by a pension scheme has yet to emerge.

"Increased demand for partial buy-outs and other ways of hedging such as longevity insurance"
Ritesh Bamania

longevity insurance," agrees Fitzpatrick. "The most important feature of 2009 is going to be products that remove risk but at the same time will be affordable to pension funds."

While Coughlan does not expect huge changes to current products, there is plenty of space for new products, according to Melcer.

"There is room, for example, for a product which insures the so-called tail-risk, in other words an insurance against pensioners living much longer than average," he says. "However, it is not yet clear that longevity swap providers have an appetite for taking on tail-risk only. But it could be very attractive for trustees."

"I expect there to be more innovation – especially in the buy-out market – and more specific products because each trustee body has very different needs in terms of plan design and membership," says Bamania. "Although it really is anyone's guess what future shape longevity will take I believe innovation is essential for the providers to survive in this competitive market."

There are currently only a handful of longevity product providers in the market, according to Coughlan. "Coming up with solutions is easy though," he says. "What is difficult is getting pension schemes to transact because these transactions require a lot of due diligence and consultants expertise is often concentrated in a small team. Consequently it does take time for pension funds to make a decision."

But Melcer expects the first longevity trade swap by a pension fund to take place soon. "We would not be surprised to see a trade taking place during the first half of 2009," he says.

"Once there has been proof of product and one pension fund has actually gone through the process this market becomes much more attractive and other deals should follow. One of the hurdles is that a longevity trade may face is the need to manage collateral arrangements – the first trade may therefore be carried out by a larger scheme, which would have the resources to work through and resolve such issues."

Life expectancy at birth in years

Location	Both sexes 1990	Both sexes 2000	Both sexes 2006	Female 1990	Female 2000	Female 2006	Male 1990	Male 2000	Male 2006
Albania	67	69	71	70	72	73	65	66	69
Andorra	77	80	82	81	83	85	74	76	78
Armenia	65	70	69	69	73	72	61	67	65
Austria	76	78	80	79	81	83	72	75	77
Azerbaijan	62	63	64	65	65	66	59	61	62
Belarus	71	69	69	76	75	75	66	63	63
Belgium	76	78	79	79	81	82	73	75	77
Bosnia and Herzegovina	72	74	75	75	77	78	69	72	72
Bulgaria	71	72	73	75	75	76	68	68	69
Croatia	72	74	76	76	78	79	69	70	72
Cyprus	76	77	80	78	79	82	74	75	79
Czech Republic	71	75	77	75	79	80	68	72	73
Denmark	75	77	79	78	79	81	72	75	76
Estonia	70	71	73	75	76	79	65	65	67
Finland	75	78	79	79	81	83	71	74	76
France	77	79	81	81	83	84	73	75	77
Georgia	68	70	70	71	73	74	64	66	66
Germany	75	78	80	78	81	82	72	75	77
Greece	77	78	80	79	81	82	75	76	77
Hungary	69	72	73	74	76	78	65	68	69
Iceland	78	80	81	81	82	83	75	78	79
Ireland	75	76	80	78	79	82	72	74	77
Israel	77	78	81	78	81	82	75	76	79
Italy	77	79	81	80	82	84	74	76	78
Kazakhstan	65	63	64	70	68	70	61	58	59
Kyrgyzstan	65	65	66	68	69	70	61	62	63
Latvia	70	71	71	75	76	76	64	65	65
Lithuania	71	72	71	76	77	77	66	67	65
Luxembourg	75	78	80	79	81	83	72	75	77
Malta	76	78	79	78	80	81	74	76	77
Monaco	78	80	82	81	83	85	74	76	78
Montenegro	76	74	74	79	77	76	73	72	72
Netherlands	77	78	80	80	81	82	74	76	78
Norway	77	79	80	80	81	83	73	76	78
Poland	71	74	75	75	78	80	67	70	71
Portugal	74	77	79	77	80	82	71	73	75
Republic of Moldova	68	68	68	71	71	72	64	64	64
Romania	70	71	73	73	75	76	67	68	69
Russian Federation	69	65	66	74	72	73	64	59	60
San Marino	79	81	82	82	84	83	76	78	80
Serbia	72	72	73	74	74	76	69	69	71
Slovakia	71	73	74	76	77	78	67	69	70
Slovenia	74	76	78	78	80	82	70	72	74
Spain	77	79	81	80	83	84	73	76	78
Sweden	70	80	81	72	82	83	68	77	79
Switzerland	77	80	82	81	83	84	74	77	79
Tajikistan	60	61	64	63	63	66	57	59	63
The former Yugoslav Republic of Macedonia	72	72	73	74	75	76	70	69	71
Turkey	65	70	73	67	72	75	63	67	71
Turkmenistan	62	62	63	65	65	67	58	59	60
Ukraine	70	67	67	74	73	73	65	62	61
United Kingdom	76	78	79	78	80	81	73	75	77
Uzbekistan	66	66	68	70	69	70	63	63	65