

Individuals are not the only ones exposed to mortality risk. Pension funds, insurers and governments also face the same risk from a different angle: the longevity risk. Insurers must maintain capital for the longevity risk that they run. Zanders consultants Tom van Zalen and Joost Berkvens show how the selling of longevity risk on the capital market helps to reduce the capital buffer.



# Long life not always a blessing

Life expectancy has increased steadily over the past few centuries. While a person born in Western Europe in 1900 had a life expectancy of 50, a person born there today is likely to live to almost 80. Pension funds and providers of annuities in particular are being hit by unanticipated increases in life expectancy. Research shows that the current value of Dutch pension liabilities increases by €30 billion for every increase of one year in life expectancy. As pension funds must pay out longer than they had expected, they have a 'short' position in longevity risk. A provider of life insurance, on the other hand, benefits from increasing life expectancy and therefore has a 'long' position in longevity risk.

Insurance and pension funds use projections of future payments to calculate the value of insurance liabilities. They use life-expectancy tables based on the latest expectations of how mortality will develop. If life expectancy increases faster than predicted, the insurers have to pay out more money. This results in a loss. JP Morgan has conducted research that shows that the underestimation of life expectancy is institutionally prevalent. This demonstrates how difficult it is to estimate mortality rates (and their development) and also indicates the source of the longevity risk.

## Attention to longevity risk

As a result of intensified supervision (Solvency II, IFRS and nFTK), there is growing interest in longevity risk and ways of controlling it. Insurers must after all allocate capital for the longevity risk that they face.

Various products have been developed to control longevity risk. The payout depends on the observed mortality in a certain population. Using these insurance-linked securities (ILS) and derivatives, insurers are able to 'sell' longevity risk to investors via the capital market. The longevity swap is an example of such a product. For this product, party A (for example, a provider of annuities) pays a fixed amount per period (plus a risk premium) to party B. This amount is based on a predicted mortality in a certain population. Party B pays party A an amount that is based on the mortality actually observed in the population. By means of this swap, party A transfers its longevity risk to party B.

The market for products based on longevity risk has various players. The most obvious are life insurers, providers of annuities and pension funds. Among investors, there is also a growing interest in these products. Just as with the products based on credit risk, the interest in this new asset class is due to the risk

premium that can be required when writing these products. ILS and the derivatives based on longevity risk also offer major diversification possibilities because they are uncorrelated with other asset classes.

The table below is an overview of the participants in the market for longevity risk, their activities and their positions (long or short) in longevity risk.

Players	Activity	'Short' longevity	'Long' longevity
Pension funds	Pensions	x	
Insurers	Annuities	x	
	Life insurance		x
Governments	State old-age pension	x	
Hedge funds/ Investors	Speculation and addition to asset allocation		x

For the most part the market for longevity risk consists of pension funds and providers of annuities, which means that on balance the market is 'short' in longevity risk. A consequence of this situation is that the buyers of longevity risk are able to require an extra premium for this asymmetrical supply and demand. For that reason the investors and hedge funds are in total 'long' in longevity risk.

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examined by comparing the expected RAROC exclusive of the hedge with the expected RAROC inclusive of the hedge. If there is an increase in the RAROC, the hedge will have the effect of creating value. If there is a reduction, the costs of the hedge will outweigh the reduction of capital.

#### Over-the-counter

A number of matters play a role when considering a hedge of this kind. For one thing the costs of setting up and maintaining the hedge may be relatively high as a result of the aforementioned asymmetry in the market for longevity risk. However, the demand among investors for products based on longevity risk is increasing. Due to this increasing liquidity, the costs will decrease

# for insurers and pension funds

#### Business case for insurers - 'Longevity swaps'

As mentioned earlier, insurers are being obliged to maintain capital for their risks. Keeping capital involves costs that will have to be made good by the expected revenues and premium incomes. The capital costs for longevity risk are frequently not factored into the setting of the premium, however. This means that the risk exerts a considerable pressure on the Risk Adjusted Return on Capital (RAROC). Additionally, the capital required by the regulator may be too high, given the actual risk that exists.

To determine whether the hedging of longevity risk is an attractive possibility, the insurer will have to identify the foundations of its business model and decide whether hedging longevity risk is aligned with it. Does this mean that a conscious selection is made when policies are issued, and that the insurer has extra information about the expected mortality risk in its portfolio? Or is the business model based entirely on making a commercial margin?

A hedge by means of longevity swaps is the simplest way of selling longevity risk to investors. Before the insurer decides on the design of the hedge, he will have to decide whether the capital reduction is worth the costs of the hedge. This can be

further. Another important matter is the possible basic risk in the hedge. The payout of products is often based on a certain index. The observed mortality in the portfolio of an insurer can differ from the index, however. As the products are sold 'over-the-counter', they can be completely structured according to the needs of the buyer or seller of the risk. This is a major advantage.

As a result of the increasing pressure being exerted by regulators and the growing interest among investors, the market for products based on longevity risk is likely to grow strongly in the coming years. This will allow insurers and pension funds to manage their capital more efficiently and investors will get access to a highly attractive new asset class. <



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