

Longevity as an asset class

Longevity as an asset class has been in existence for a very long time. For years, pension providers and insurance companies have been exposed to and have had to manage and deal with this risk. As transactions have typically been extremely large, in the hundreds of millions of dollars, historically they have been inaccessible to most investors in the capital market. However, in the last few years, we have seen a sea change as more investment banks are entering into this arena, which in turn is making this asset class increasingly more accessible to investors. So what is longevity risk?

Development of longevity as an asset class

As the name suggests, longevity risk centres on people living longer than expected. Typical institutions that are exposed to this risk include annuity providers, defined benefit pension plan providers, not to mention holders of life settlements portfolio, who are obliged to pay out a guaranteed or pre-determined amount during the lifetime of the insured. Any extension in the longevity of the insured could have a negative impact on the return to investors or shareholders. On the opposite side is mortality risk which centres on people living shorter than expected. Typical institutions exposed to this risk are pension providers, life insurance companies and life time mortgage providers. Insurance companies collect premiums - which form their revenue stream - from policy holders until such time as the policy matures at which point the insurance companies will have to pay out the face value of the policy. So from their point of view, the longer the insured lives, the higher the revenue stream and the greater the deferment on the payout of the death benefit, thereby increasing the return to shareholders or investors.

Party	Instrument	Risk exposure	Effect of longer life
Pension fund	Pension	Longevity risk	More cash out
Life insurance co.	Annuity	Longevity risk	More cash out
Government	Benefit	Longevity risk	More cash out
Individual	Life insurance	Longevity risk	More cash out
Life insurance co.	Life insurance	Mortality risk	More cash in
Reinsurers	Life insurance	Mortality risk	More cash in

Until recently it has not been easy for investors to invest purely in longevity or mortality risk due to the size of the transactions. The only way investors could gain exposure was to invest directly into the stocks of the relevant companies but the risk taken on was not distilled and was correlated to the wider financial market. As more players enter the longevity market, more financial products are being offered, making it increasingly easy for investors to participate without having to take on the financial market risk. Instruments that are available in the longevity market include:

- Cash market – life settlements, blocks of annuities, reverse mortgages and life tenancies
- Longevity/mortality swap – longevity/mortality swap or options
- Structured notes – pass-through, principal protected notes, coupon protected notes and leveraged notes
- Indices – targeted population indices and broad population indices

At the heart of longevity risk is the risk in the mortality improvement of the population or sample. Mortality rates therefore underpin the analysis of longevity risk. Historical mortality rates are easily observable and are represented by the probability of people at a given age, of a particular gender and of a particular health status (e.g. smoker versus non-smoker) dying in a particular year. The new financial products on longevity risk can be broadly split into macro longevity and micro longevity.

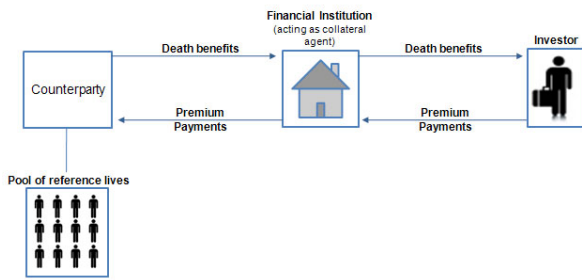
Macro longevity versus micro longevity

Macro longevity relates to the general population and is generally represented by a sample size in the tens of thousands of lives. The longevity estimate used for the transactions are based directly off the mortality tables. This mortality rate is the principal factor in longevity estimates and is based purely on historical observations, mortality improvement statistics and stochastic modelling.

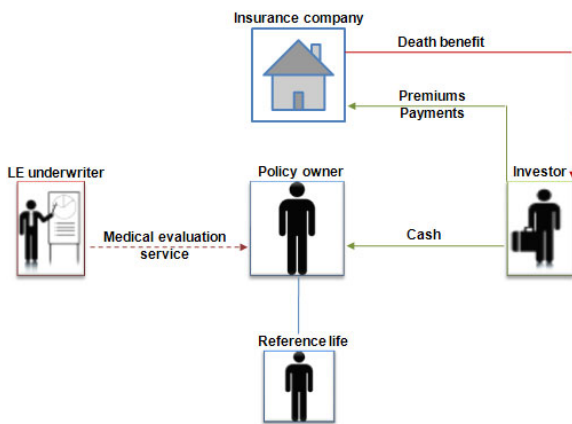
An example of macro longevity risk could be a pension fund or insurance company having the risk of paying annuities to say 100,000 policy holders age 80 or above. As mortality rates improve and the longevity of the policy holders extend, the provider must meet capital adequacy requirements imposed by the regulatory bodies either by selling the risk to the capital market, buying reinsurance or a combination of the two methods. Other types of macro longevity risk include natural catastrophe and extreme mortality, which are typically offered to the capital market via the insurance linked securities market where the reinsurers issue bonds linked to certain extreme events which are negatively correlated to the extended longevity risk.

In recent years, the capital market has been structuring products to transfer the macro longevity risk to investors. However, with typical transactions size in the tens of millions, this type of risk was virtually inaccessible for non-institutional investors until the recent introduction of funds which invest into macro longevity risk.

Micro longevity on the other hand is a much more accessible asset class and has seen interests from both retail and institutional investors. Reverse mortgages, life tenancies or *rente viagère* have existed for a long time while new entrants such as life settlements have seen interests from investment banks wanting to get into this new asset class.



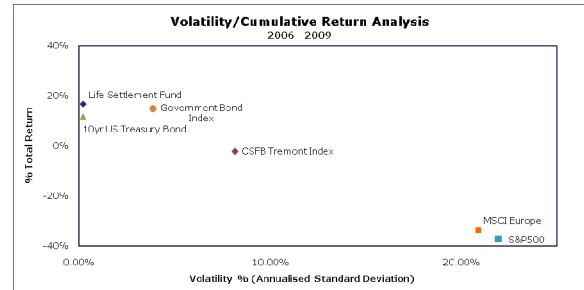
The key difference between micro longevity and macro longevity is that the former involves a much smaller but specific sample of the population. Unlike the sample size in macro longevity which is in the tens of thousands and involves primarily the general population, micro longevity targets a specific sub-set of the population with a sample size of between 200 and 1,000, lives which are medically underwritten to arrive at a life expectancy estimate. The medical underwriters review the health of the insured and his medical history, then using the basic mortality table as a starting point, make adjustments based on actuarial assumptions, to arrive at an estimated life expectancy.



The table below summarizes the primary differences between the two types of longevity risks:

Criteria	Macro longevity	Micro longevity
N° of lives in portfolio	10,000 to 100,000	200 to 1,000
Trade size (in \$'000s)	10,000+	100 to 10,000+
Mortality risk volatility	Low	High
IRR estimate (%p.a.)	5% to 7%	7% to 15%

As the sample size is smaller, by definition, micro longevity is more volatile than macro longevity as a longevity investment. However, the return on both types of investments compares favourably to other asset classes as illustrated by the graph below which shows return versus standard deviation of different asset classes.



Access to longevity risk via investment funds

For investors who are interested in investing in longevity, where should they start? Due to the complex nature of assessing the risk in this asset class, a pure longevity play is not for the retail investor. There are no longevity UCITS III funds due to diversification issues. Investors who invest into a single life settlement transaction will experience huge volatility in the investment as the return depends solely on the longevity of a single individual. Institutional investors with large funding abilities and resources to analyse the risk factors can invest in large longevity transactions to achieve diversification.

Other investors should consider investing in a fund where due to collective investments, diversification can also be achieved. When investing in collective investment funds, the key is transparency – understanding the quality of the origination process, the valuation methodology and the liquidity constraints. In addition, investors looking to access longevity via an investment fund need to select an investment manager who has the required experience, knowledge and specialisation in this asset class including a proven and sustainable track record. Longevity investment should be viewed as a long term investment by the very nature of the fact that the asset class is semi-illiquid. The table below illustrates the suitability of various longevity investments for different types of investors.

Investor type	Investment range (USD)	Longevity instrument	Longevity risk
Retail investor	< \$125,000	Index as available	Micro
Professional investor	> \$125,000	Fund	Macro & Micro
Asset manager	> \$1,000,000	Fund	Macro & Micro
	> \$10,000,000	Fund or synthetic	Macro & Micro
	> \$25,000,000	Synthetic	Macro & Micro
	> \$100,000,000	Life settlement portfolio	Micro
Pensions manager	> \$1,000,000	Fund	Micro
	> \$10,000,000	Fund or synthetic	Micro
	> \$25,000,000	Synthetic	Micro

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