Interest rate risk in insurance: a primer

Ilker Aslan, PhD · Lecturer, Kalaidos University of Applied Sciences, Zürich · ilker.aslan@alumni.unifr.ch

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Pre-read for a lecture in Topics of Applied Risk Management, Department of Finance, University of Zurich: the insurance basics behind the interest rate discussion, in five minutes.

Why insurers care about interest rates

Insurers collect premiums now and pay claims and benefits later, often decades later. Life liabilities usually run longer than the assets backing them, so a typical life insurer loses value when rates fall: the opposite of a typical bank.

Under the Swiss Solvency Test (SST) and Solvency II, liabilities are valued at their best estimate, the expected cash flows discounted on a risk-free curve, plus a risk margin. Capital must cover a one-year shock: 99% expected shortfall in the SST, 99.5% value at risk under Solvency II.

The liabilities

- **Claims reserves (non-life):** payments for past claims, mostly within a few years; decades for some liability claims.
- **Savings policies:** a guaranteed minimum rate each year plus profit participation.
- **Annuities in payment:** fixed payments for life; long duration, with longevity risk on top.
- **Swiss pensions (BVG/LPP):** savings earn at least the BVG minimum rate and convert into a pension at 6.8% on the mandatory part.

The options inside

Each guarantee is an option the policyholder holds and the insurer has sold. Its value is computed over thousands of market-consistent rate scenarios, and it rises with rate volatility.

- **Minimum rate guarantee:** bites when rates fall; short floors or receiver swaptions.
- **Annuity conversion rate:** bites when rates fall or longevity rises; short receiver swaptions.
- **Surrender at a guaranteed value:** bites when rates rise; short payer swaptions.
- **Profit participation:** the insurer shares good returns but keeps the losses.