



Institute
and Faculty
of Actuaries

Money for Nothing, Spreads for Free

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Agenda

- Introduction
- Asset selection
- Synthetic alternatives
- Efficient hedging
- Diversification

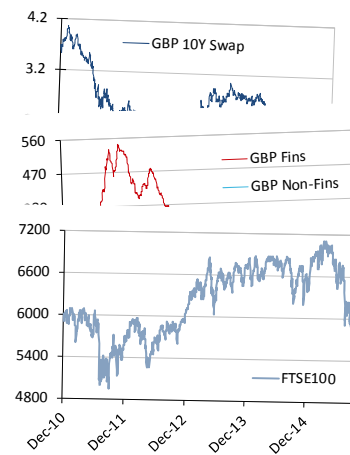


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Introduction | Where is the value?

- Low interest rates
- Tight credit spreads
- Inflated equity markets
- Increased demand for illiquid assets



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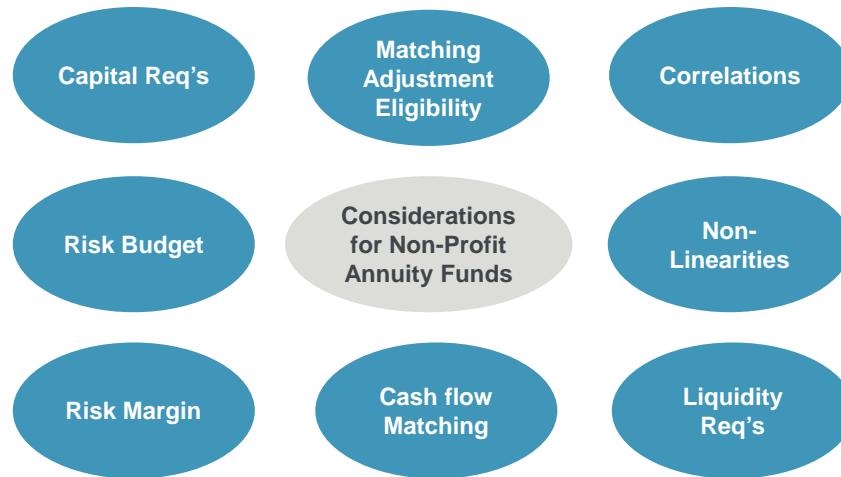
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Asset Selection



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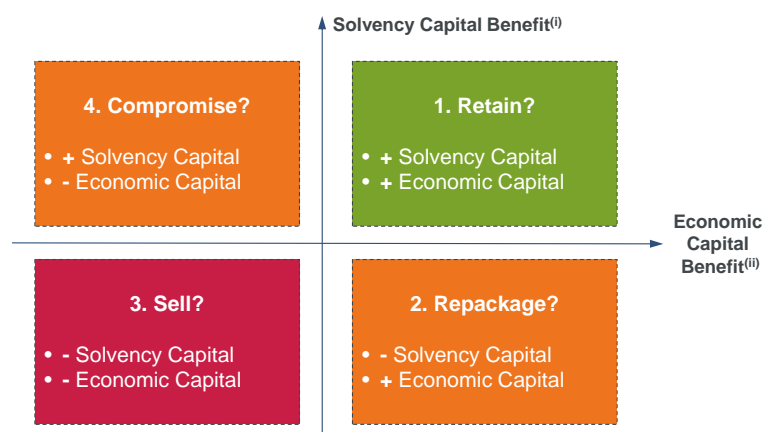
Asset Selection | Solvency II ALM Strategy



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Asset Selection | Capital Efficient Investments



(i) Solvency II Internal Model or Standard Formula
(ii) Internal assessment of economic risk

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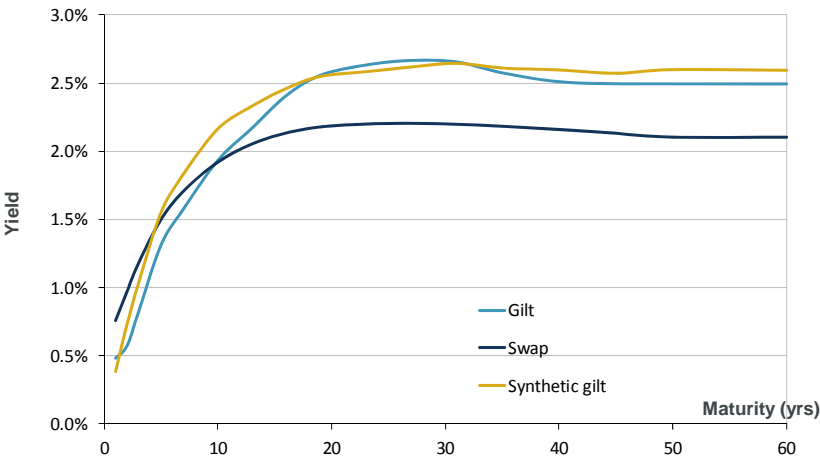
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Synthetic Alternatives



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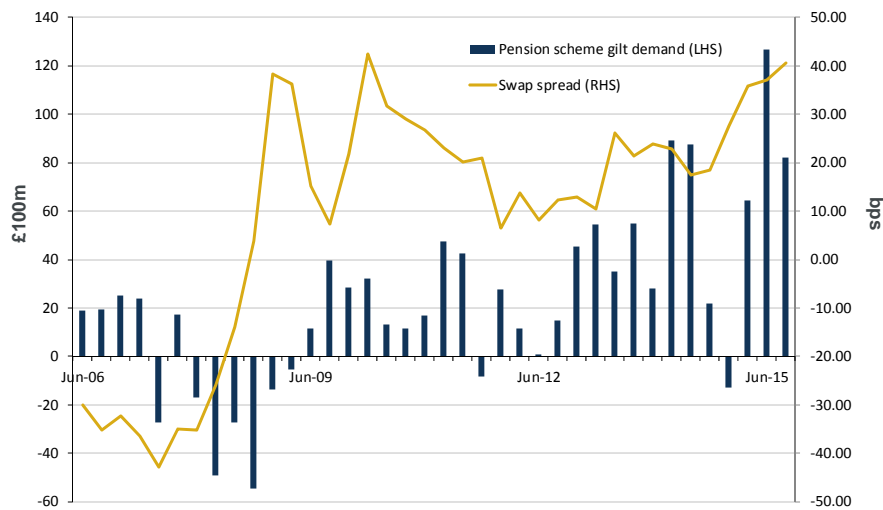
Synthetic Alternatives | Gilts



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Synthetic Alternatives | Unfunded Exposure



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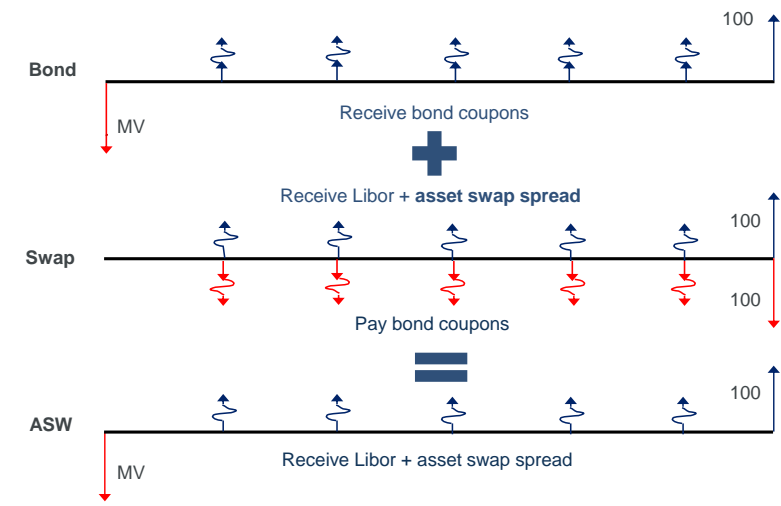
Synthetic Alternatives | Spreads

- **Z-spread:** constant spread which, when added to each point on the [which] spot-rate curve, sets the PV of cash flows equal to the current price.
- **Nominal spread:** difference between the IRR of the bond and the IRR on a government bond of equal tenor.
- **Asset swap spread:** to transact an asset swap, the counterparty purchases a bond of fixed (or index-linked) coupons and immediately enters into a swap converting the cash flows into floating plus a spread. The spread sets the PV equal to the current price.

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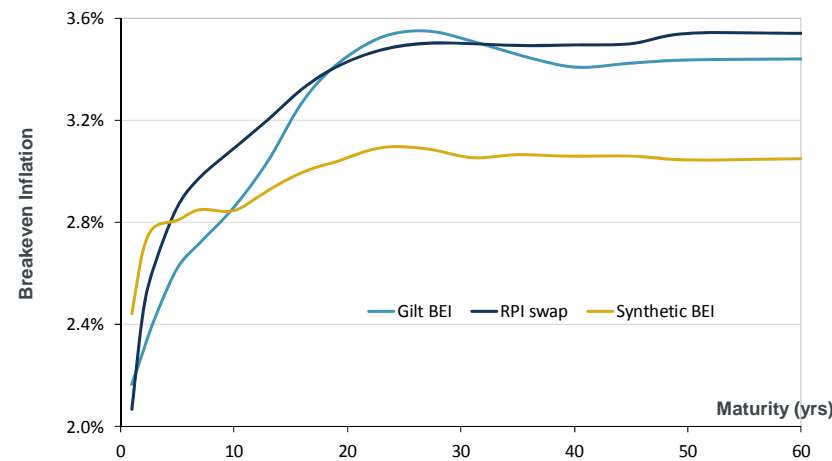
Synthetic Alternatives | Asset Swaps



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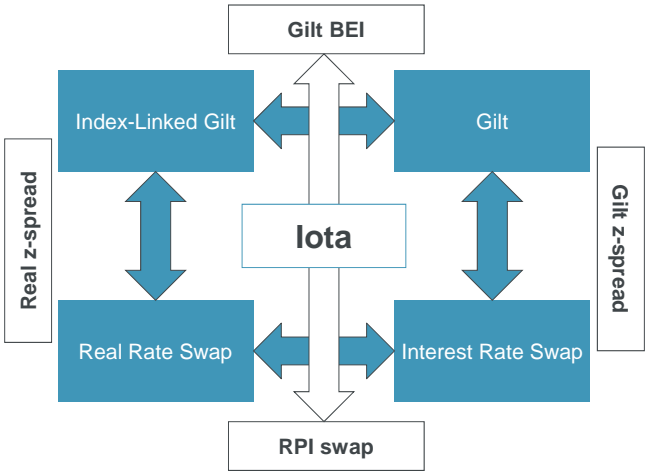
Synthetic Alternatives | Inflation



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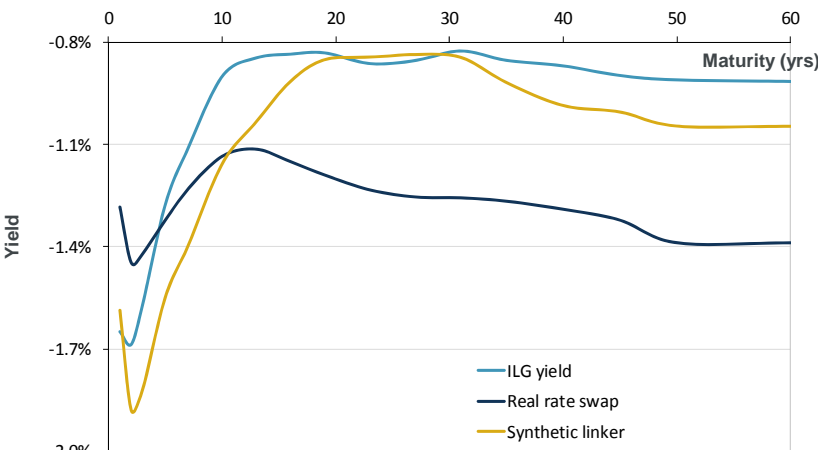
Synthetic Alternatives | Iota



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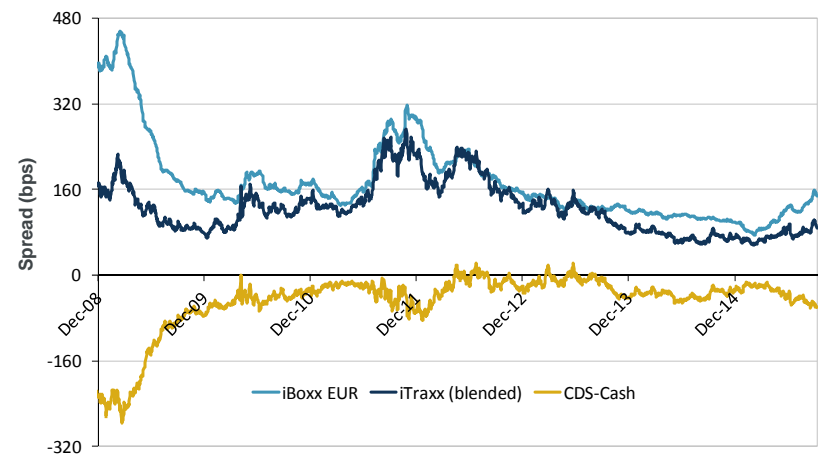
Synthetic Alternatives | Index-Linked Gilts



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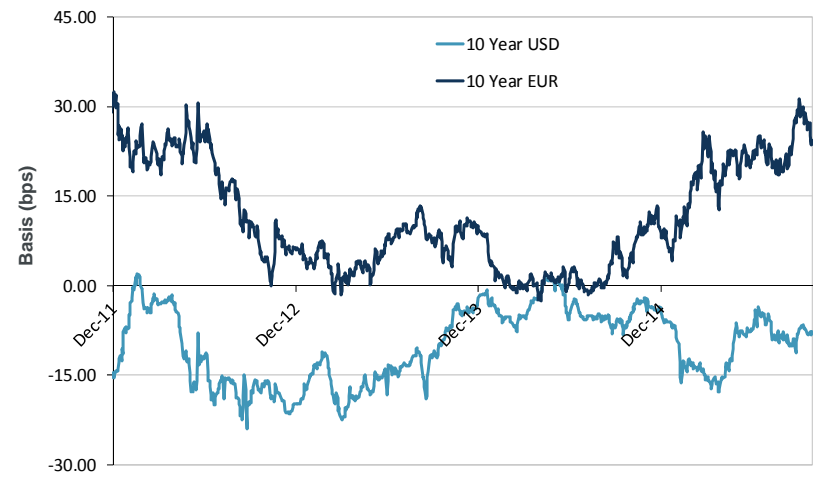
Synthetic Alternatives | Cash-CDS Basis



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Synthetic Alternatives | Cross-Currency Basis



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Efficient Hedging



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Efficient Hedging | Arbitrage-Free Pricing

Principle of no arbitrage:

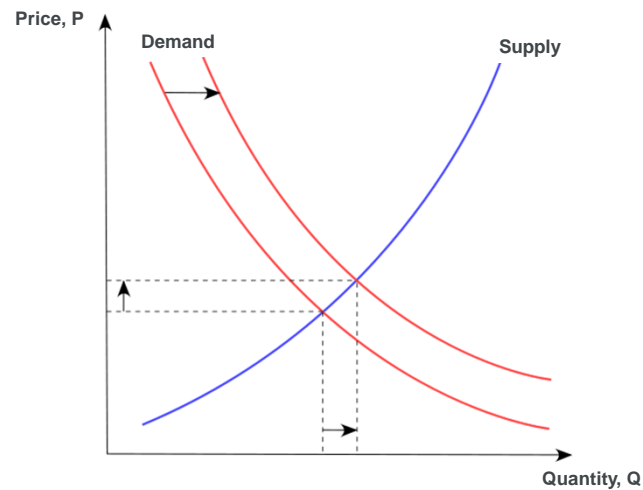
If two securities provide the same cash flows under all future circumstances, then the two securities should have the same price.



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Efficient Hedging | Equilibrium Pricing



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Efficient Hedging | Implied Volatility

- We can back-solve for the **volatility implied** by market prices
- In many markets, **implied volatility** varies with **strike**
- Volatility **skews** or **smiles** are often driven by **supply and demand**

Distributions of market prices calibrated to implied volatility can be quite different to distributions calibrated using other measures of volatility.

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Efficient Hedging | Framework

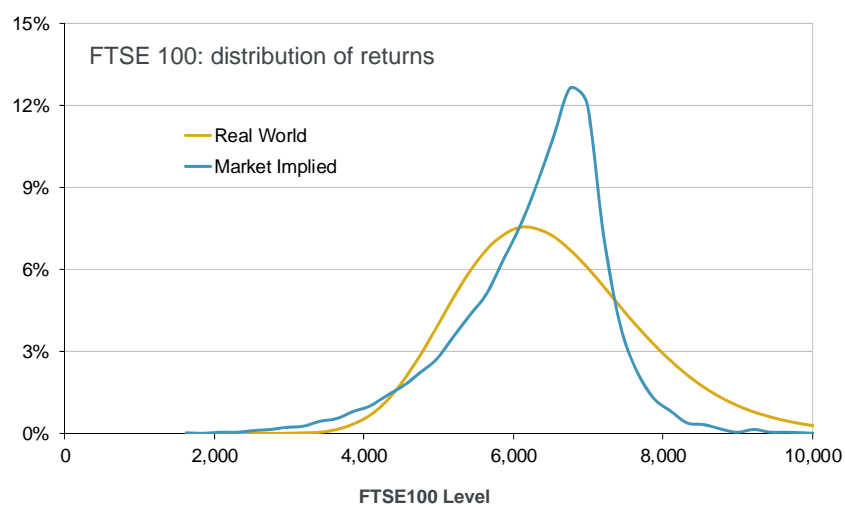
Comparing market implied returns distributions with a real world view can identify times when hedging with options becomes relatively cheap/expensive.

Relative movement over time may be a greater indicator than absolute levels.

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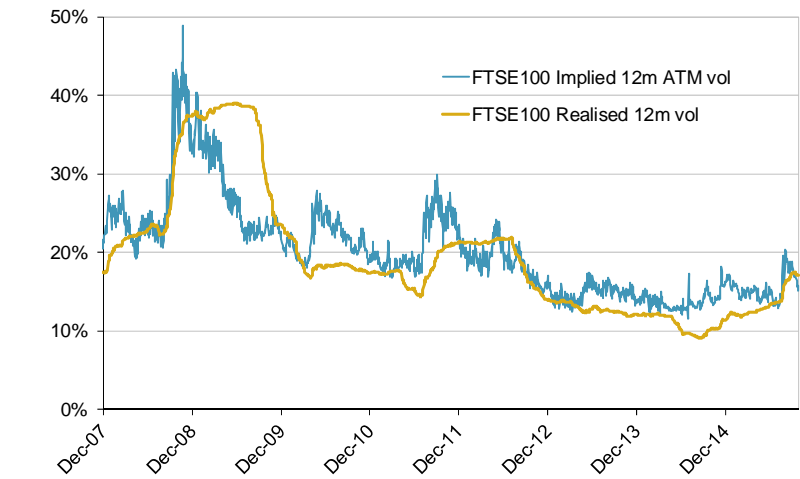
Efficient Hedging | Equity



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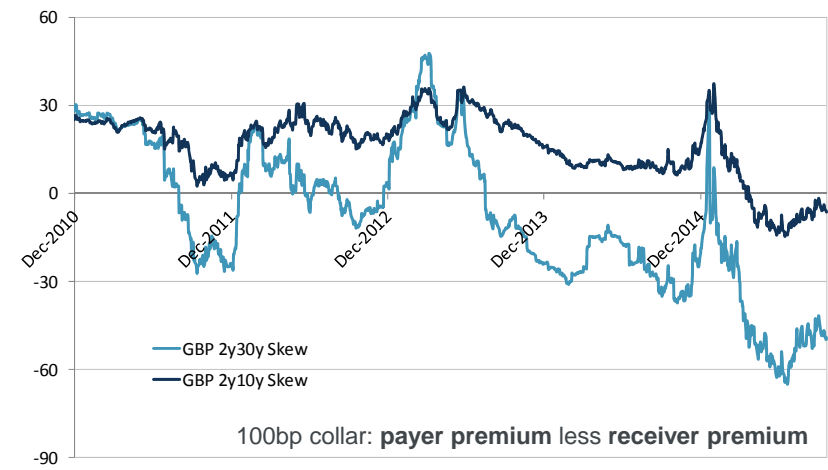
Efficient Hedging | Realised Equity Volatility



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Efficient Hedging | Swaptions

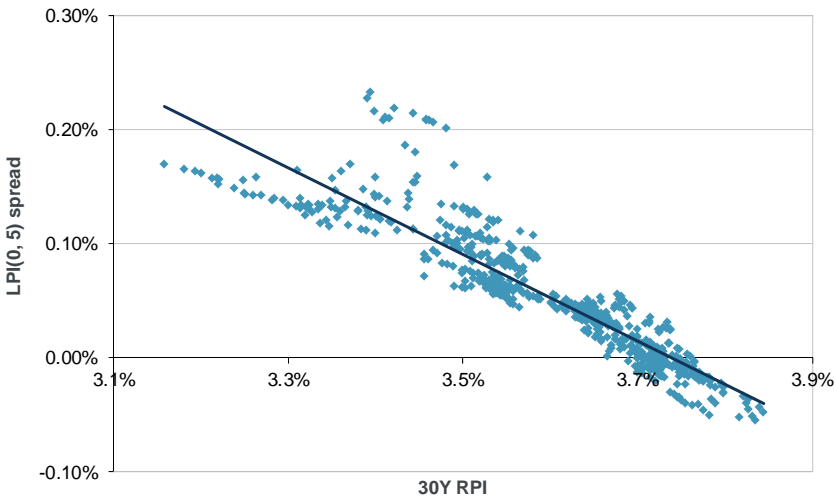


100bp collar: payer premium less receiver premium

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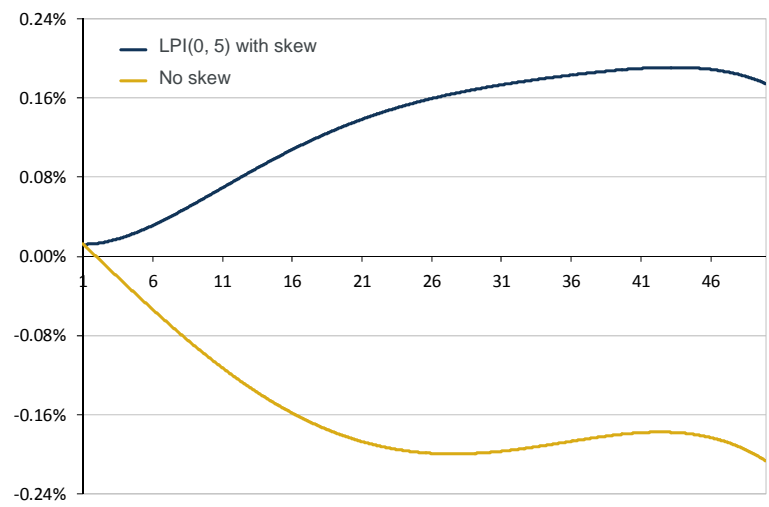
Efficient Hedging | LPI



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Efficient Hedging | LPI



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Efficient Hedging | Regulatory Drivers

- **CRD IV**
 - Risk-weighted assets (RWA)
 - Credit valuation adjustment (CVA)
 - Leverage ratio
 - Liquidity requirements
- **EMIR**
 - Central clearing
 - Margin for uncleared

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Diversification



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Diversification | Return on Capital



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Diversification | Correlation

- SCR capital may **reduce by 50% or more** post-diversification
- Selecting **diversifying risks** is fundamental to many life insurance businesses e.g. longevity and mortality
- Finding **uncorrelated investments** can be challenging
- Significant work may be required to prove internal model **assumptions** are valid (particularly in the tails)

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Diversification | Asset Selection

- Main diversification of any asset in annuity books is likely to be **versus longevity risk**
- What is the scope for achieving lower capital requirements within a matching portfolio by **diversifying the investment strategy**?
 - **Limited scope under Standard Formula**
 - **Internal Model allows for more sophisticated modelling**

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Summary



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Questions

Comments

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