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Are Interest Rates an 'Unrewarded' Risk?

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14 May 2014



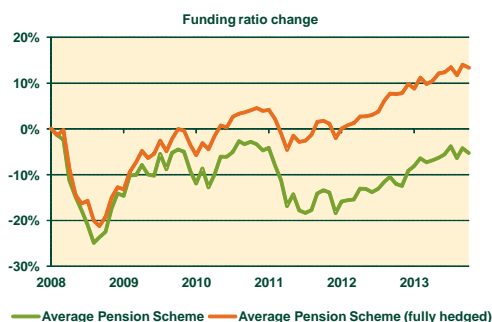
Why this matters



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Impact of interest rates

- The average fund has underperformed its liabilities by 1% p.a. since June 2008
- If the average fund had done everything the same, but hedged its liabilities (swap overlay), it would have outperformed its liabilities by c. 2.5% p.a.
- The swap overlay would also have reduced the tracking error by 20%



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Let's start with a poll

- Which of these statement most closely describes your view?
 1. Any unhedged interest rate exposure is risky
 2. DB pension funds don't have interest rate risk – that's just mark to market volatility, an accounting detail



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More seriously

- Which of these statement most closely describes your view?
 1. One should never expect to earn reward from taking interest rate risk
 2. One should always expect to earn reward from taking interest rate risk
 3. It depends

What we will cover today

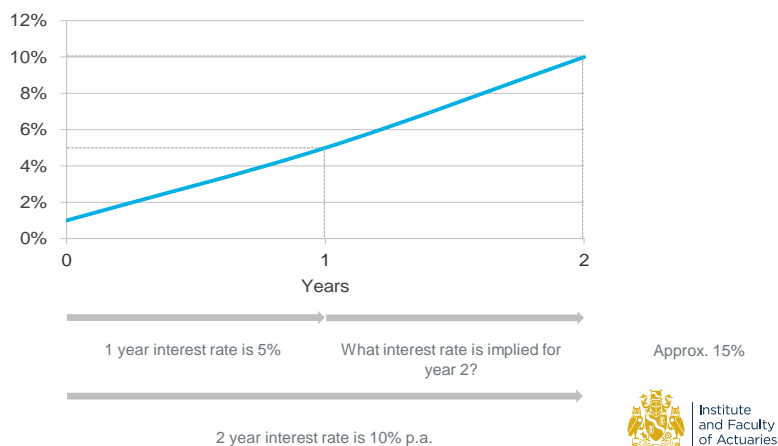
- Understanding forward rates
- A simple example
- Are forward rates an unbiased predictor of future spot rates?
- Conclusions

Understanding forward rates



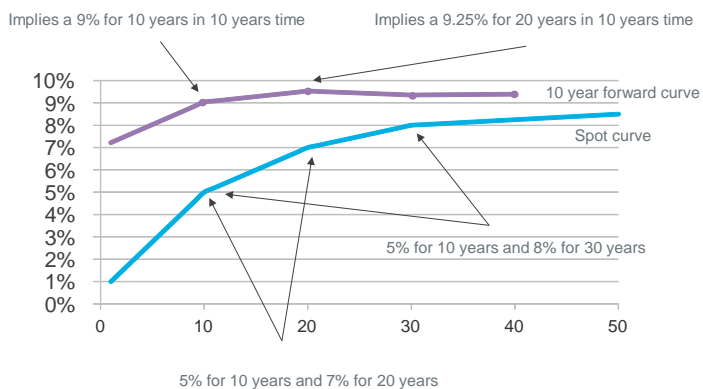
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What are forward rates?



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The forward curve

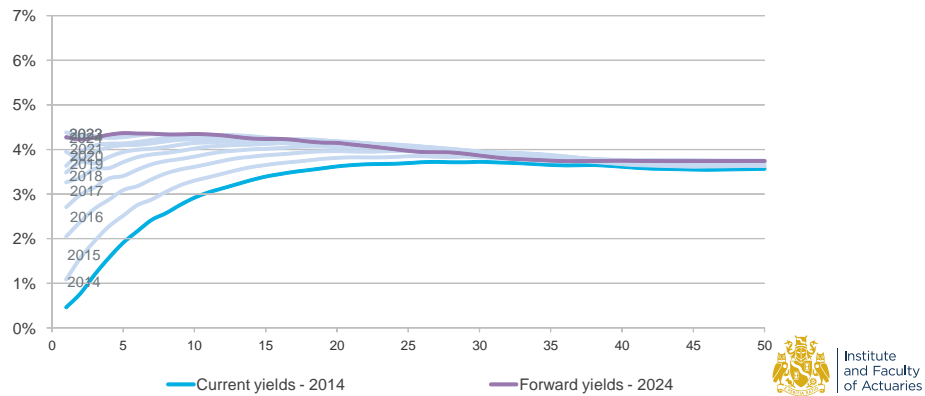


Why does this matter?

- If you hedge, you lock into forward rates
- Being unhedged only benefits you if interest rates rise by more than forward rates already imply

What are current forward rates?

Forward rates - 31 March 2014



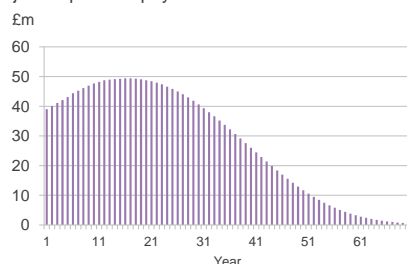
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A simple example

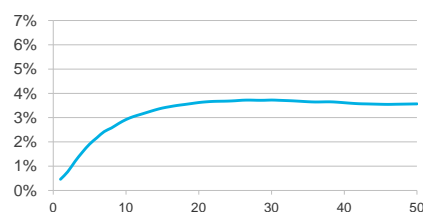
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Impact on liabilities

Projected pension payments



Current yields - 31 March 2014



Current value of the liabilities is
£1bn

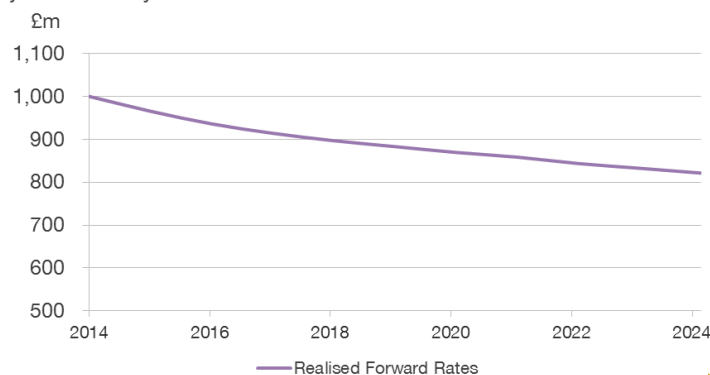


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How is the liability value expected to develop?

Projected liability value

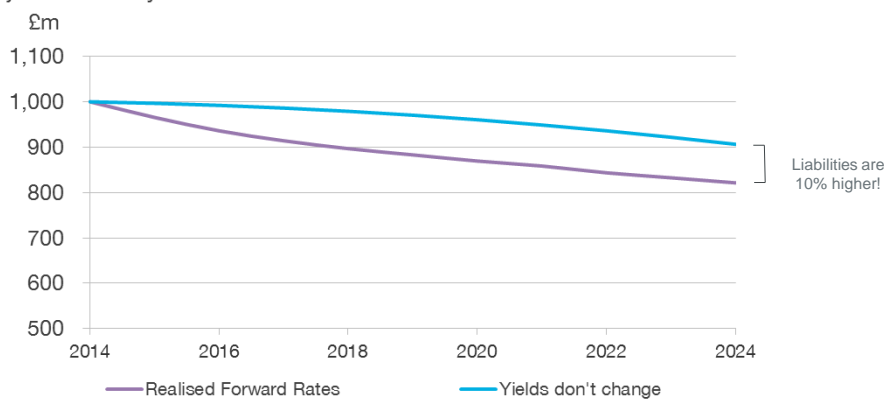


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What if interest rates don't rise?

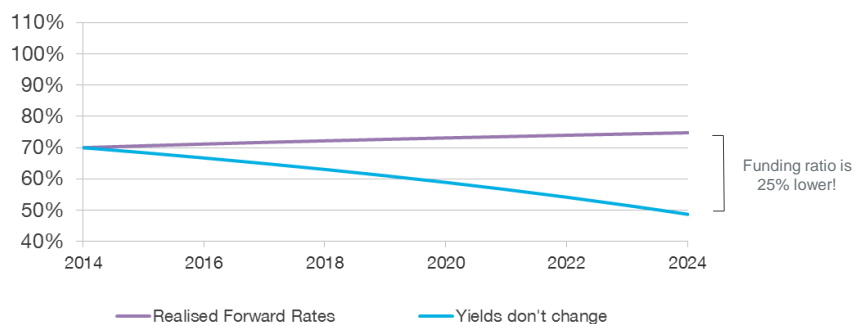
Projected liability value



Impact on funding ratio

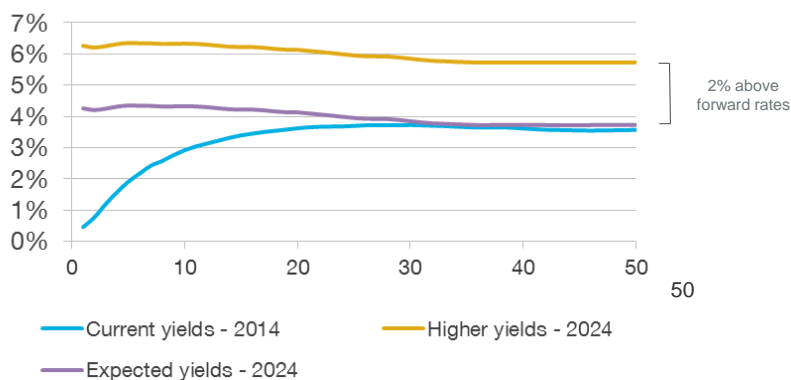
The fund is 70% funded, and is aiming for the assets to outperform the liabilities by 2.5% p.a. (illustration assumes no further contributions are paid into the scheme)

Projected funding ratio



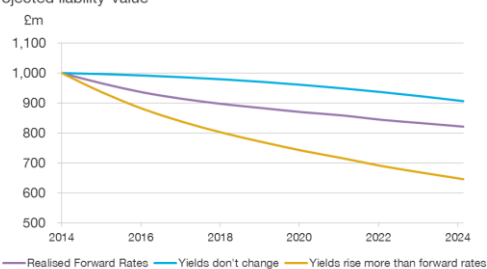
But what if yields rise by more than the forward rate?

Market expectations of yields

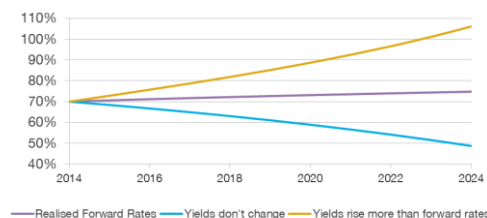


Impact on funding ratios

Projected liability value

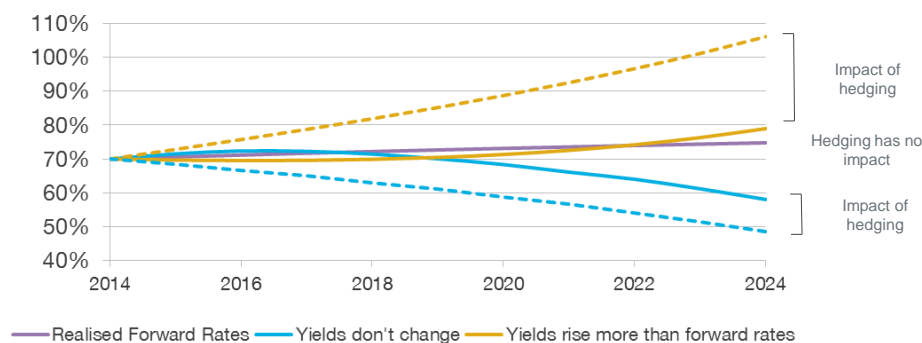


Projected funding ratio



What impact does hedging have?

Projected funding ratio



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Conclusions

1. Hedging all interest rate risk is a no brainer if you believe:

- Yields will fall
- Yields will stay the same
- Yields will rise, but by less than implied by forward rates
- You have no idea what will happen to yields

2. Hedging some interest rate risk makes sense if you believe:

- Yields will probably rise by more than implied by forward rates, but
- You might be wrong



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Are forward rates an unbiased predictor of future spot rates?



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Back in the 1960's

- The term 'forward rate' was coined by Hicks in 1939
- In the 1950's simple assumption was forward rates = future spot rates (i.e. perfect foresight)
 - That was quickly revealed to untrue
- In the 1960's market efficiency became dominant
 - Rational expectations -> markets do not persistently mis-forecast
 - In bond markets this led to the Expectations Hypothesis



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The Expectations Hypothesis

- In its pure form, the Expectations Hypothesis stated that
 - Forward rates are unbiased predictors of future spot rate
 - If this were true, then interest rates would always be an unrewarded risk
 - Also implies that yields curves should, on average, be flat
- However, applied work quickly identified what seemed to be persistent gaps between forward rates and future spot rates
- Term Premium = forward rate – expected future spot rates
- Arguments were advanced as to why the Term Premium should be positive
 - Lenders need a higher yield to invest longer term

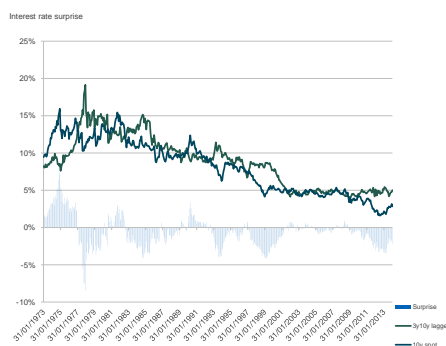


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Time varying term premia

- In the 1970's, 1980's and 1990's there were hundreds of academic studies trying to explain the term premium
- Key challenge is identifying what is expected by markets
 - Survey approaches
 - Econometric models
 - Empirical approaches



Source: Cardano

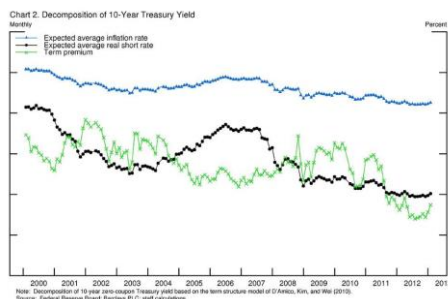


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What about negative term premia?

- It's now generally recognised that the term premium can be negative as well as positive
- Bernanke explained the decline in the term premium as follows
 - Volatility of rates reducing
 - Bond/equity correlation up
 - “Risk off” asset status
 - Increased demand – e.g. pension funds
 - Quantitative Easing



Conclusion – what do we know about term premia today?

- Empirically the term premium is not zero and not constant
 - It can also be negative for protracted periods
- Theory can be invoked to explain positive and negative term premia
 - Supply/demand, behavioural finance, central bank balance sheets

Conclusions



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Overall conclusions

- Hedging is an important issue for pension funds
- By hedging one locks into forward rates
- There are clear empirical and theoretical grounds for concluding that interest rates represent a rewarded risk
 - i.e. the term premium is rarely zero
 - However, at times the reward is from being over hedged and others under hedged
 - Determining the potential reward from interest rates requires models and assumptions



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