Pension Fund Investment

Where do funds go from here?

A presentation to the OPA, Sunbury
by Spencer Bowen

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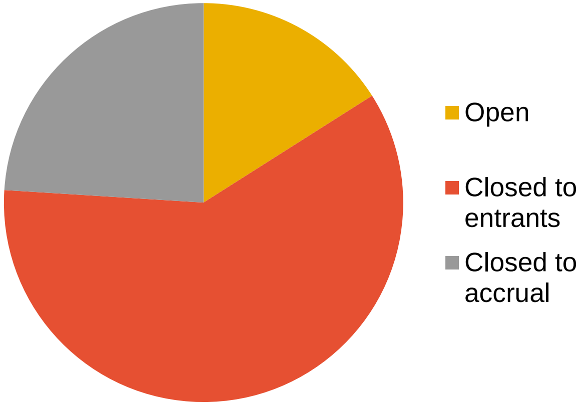
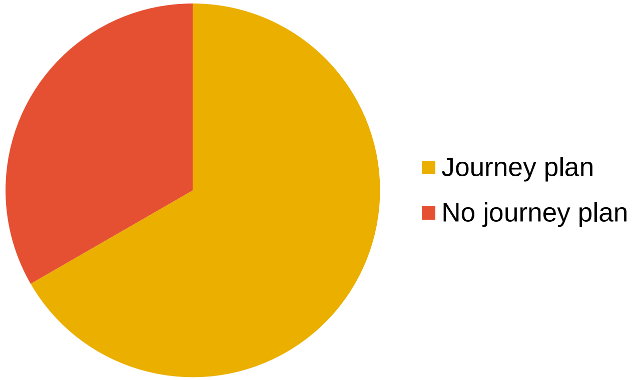
TOWERS WATSON

The game has changed

- Most funds are now closed and on a derisking journey

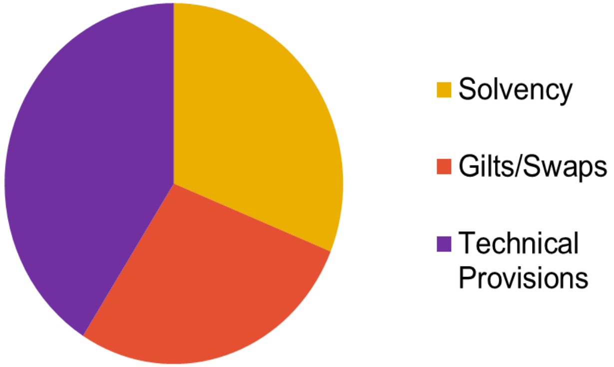


Source: tPR



Source: Towers Watson

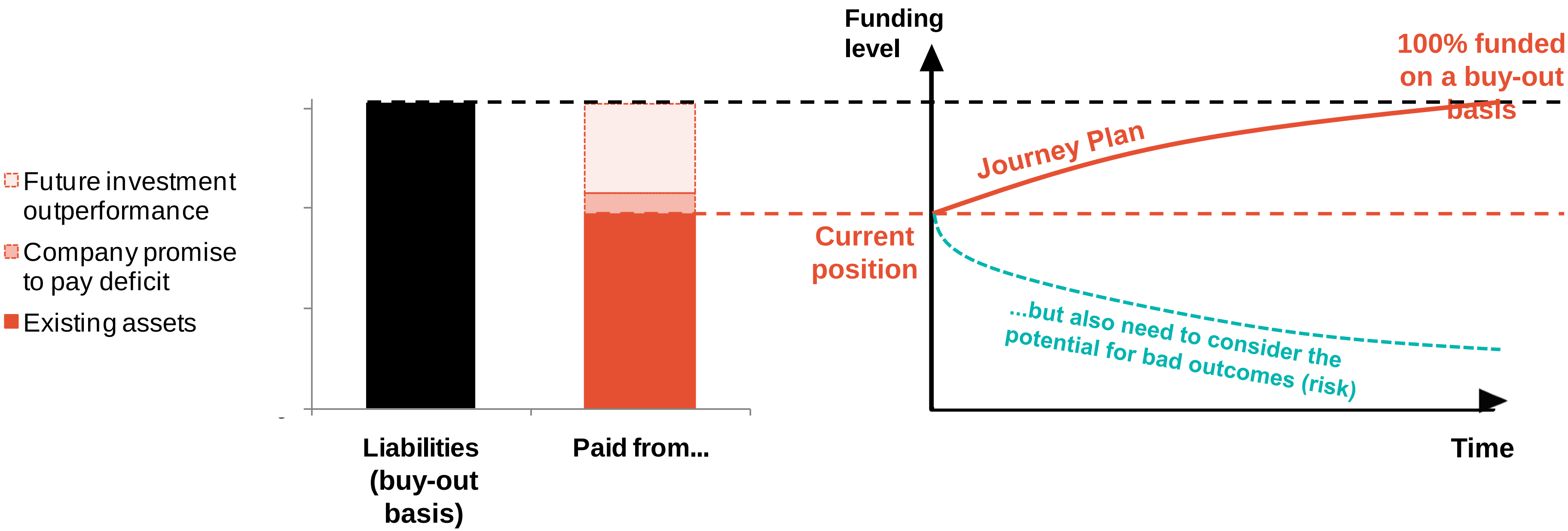
Long-term funding targets



(Source: Towers Watson Pension Fund Survey 2012)

Journey Planning

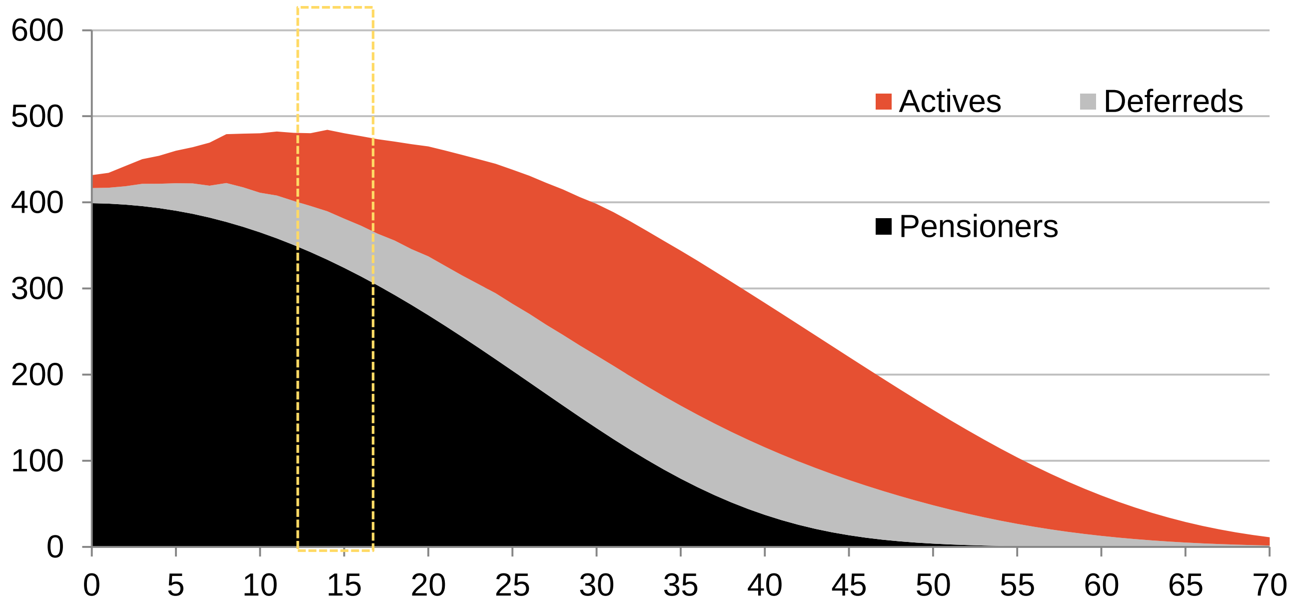
How best to move towards the end game?



Key questions:	Possible answers / considerations:
Where do you want to get to?	100% funded on gilts basis? Buy-out? Include additional margin for prudence (demographic/mortality risk)? Less prudent target?
When do you want to get there?	Sooner is preferable, but what is affordable? A shorter timeframe will require a higher outperformance target. How much risk is acceptable along the way?
How do you want to get there?	What mix of contributions and investment outperformance? Targeting higher investment outperformance means a greater risk of a fall in funding level
What will you do if you don't get there?	Ask the Company for more money? Take more investment risk? Extend the timeframe?

Set time horizon for vision

Cashflow profile over the next 70 years (£m)
Assumes single projection on central valuation assumptions



- Beware liability profile when determining the length of journey plan

Monitoring the journey plan

- In practice, actual returns will differ from those planned.
- Consider a dynamic approach (utilising of pre agreed triggers) to respond to these changes, as well as a medium to longer term target.
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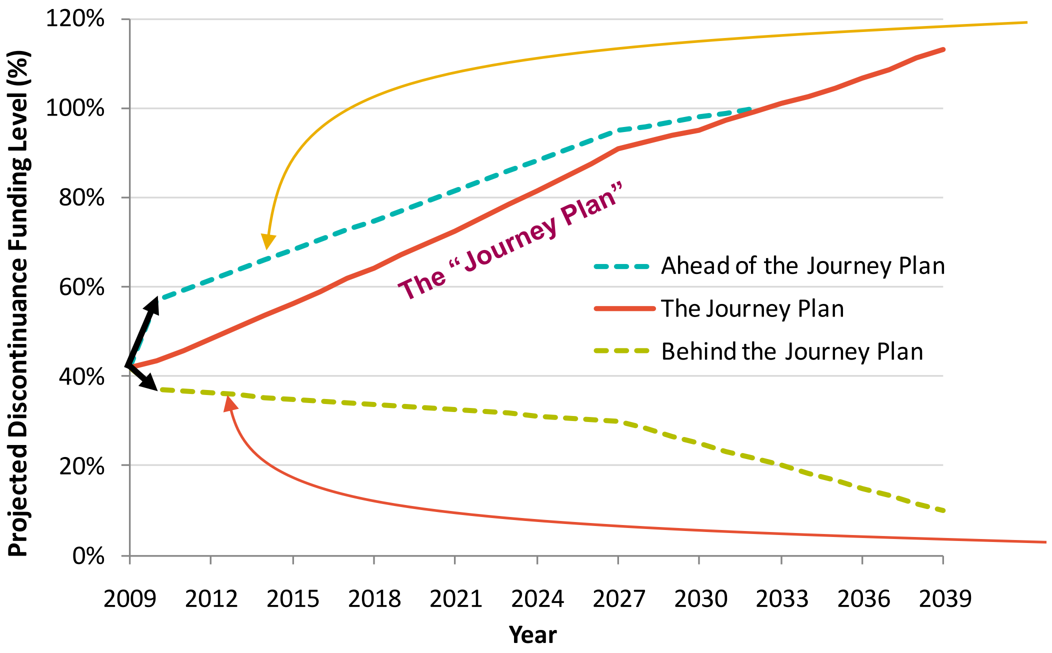
How is the Scheme's discontinuance funding level expected to progress?



1) Go for a **shorter time horizon** to reach full funding
2) Take **less risk and adopt a lower target return** in the Journey Plan investment strategy
3) Agree to **reduced deficit contributions** from the Sponsor

1) Accept a **longer time horizon** to reach full funding
2) Take **increased risk and adopt a higher target return** in the Journey Plan investment strategy
3) Obtain **additional deficit contributions** from the Sponsor
4) Carry out a **liability management exercise** to reduce the Scheme's liabilities/deficit

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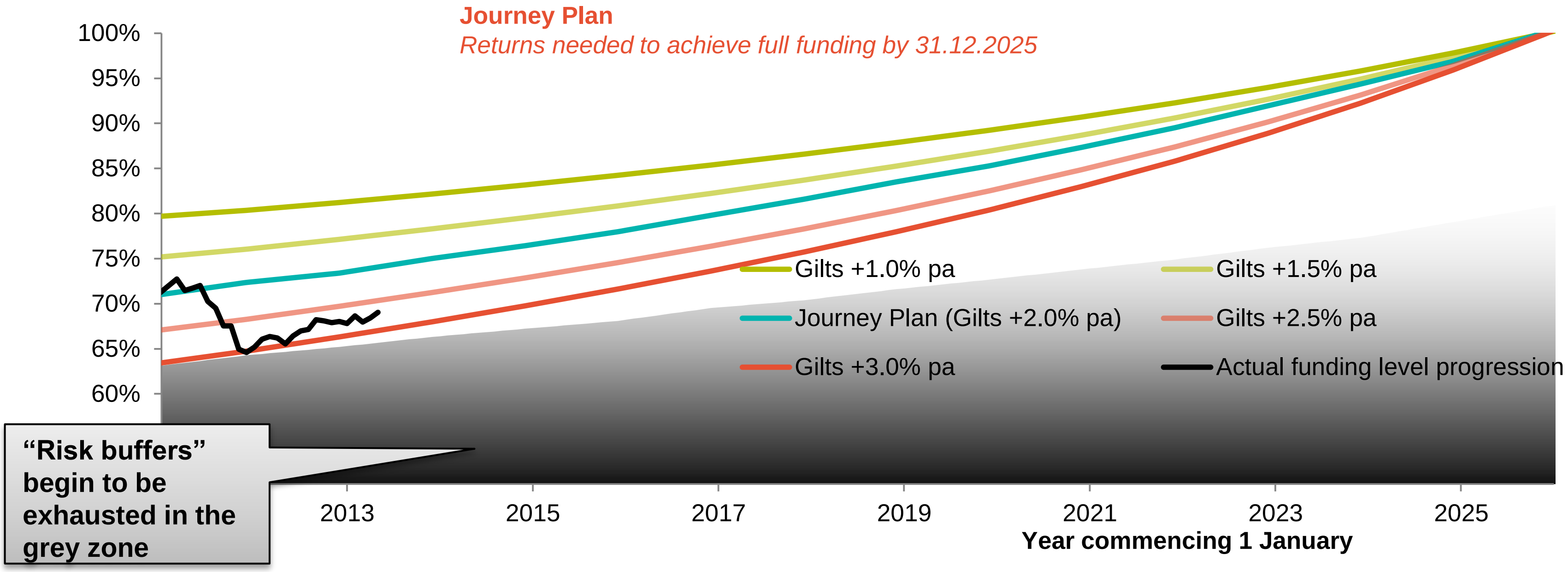
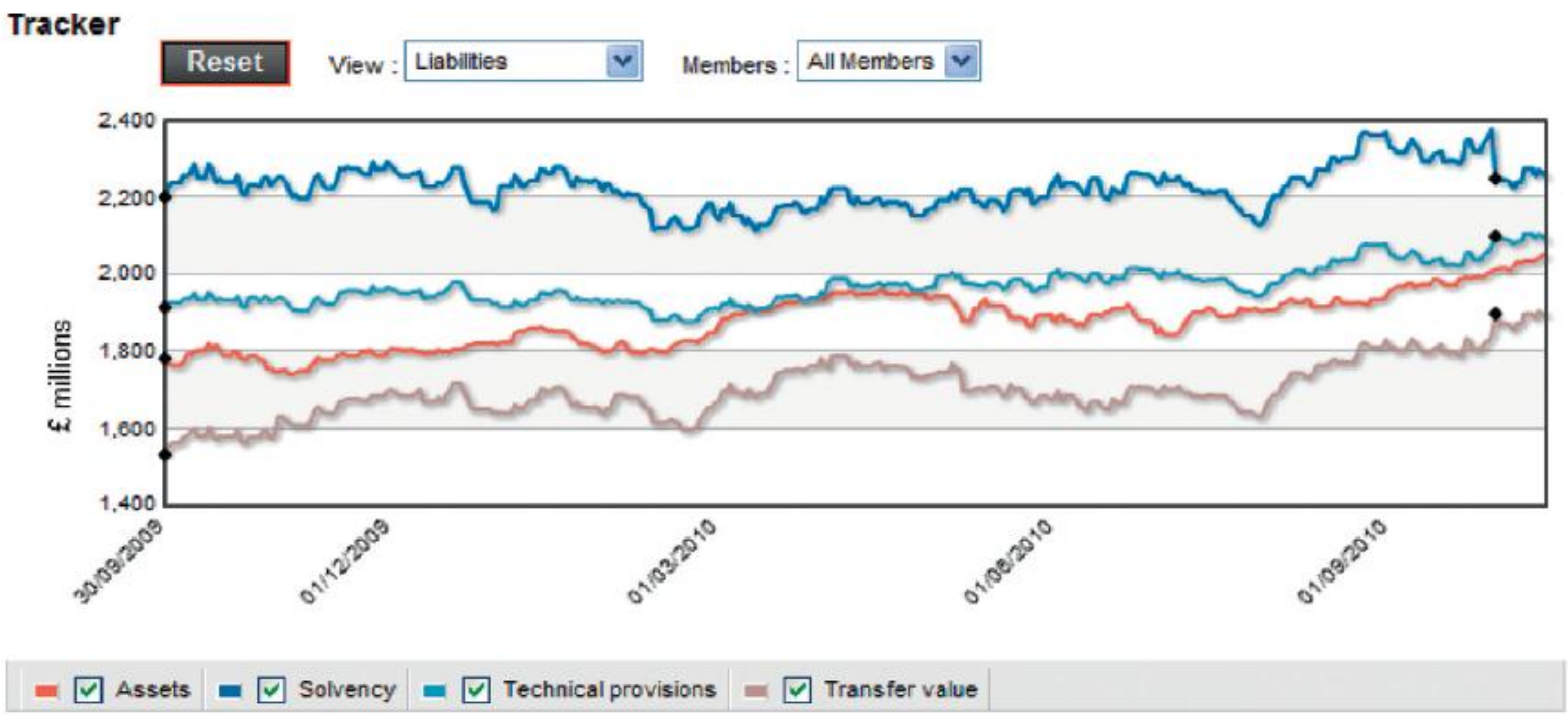
Management of the journey plan – upside and downside

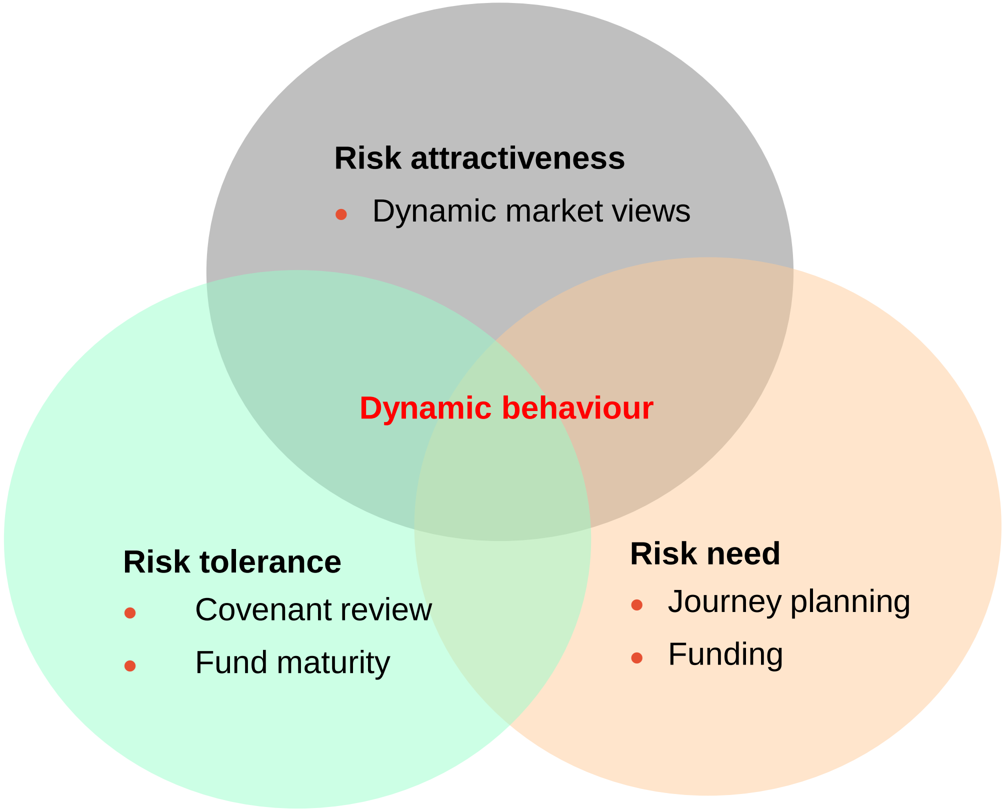


Managing risk need

- Real-time-monitoring
- Pre-agreed action plans
- Appropriate investment strategy

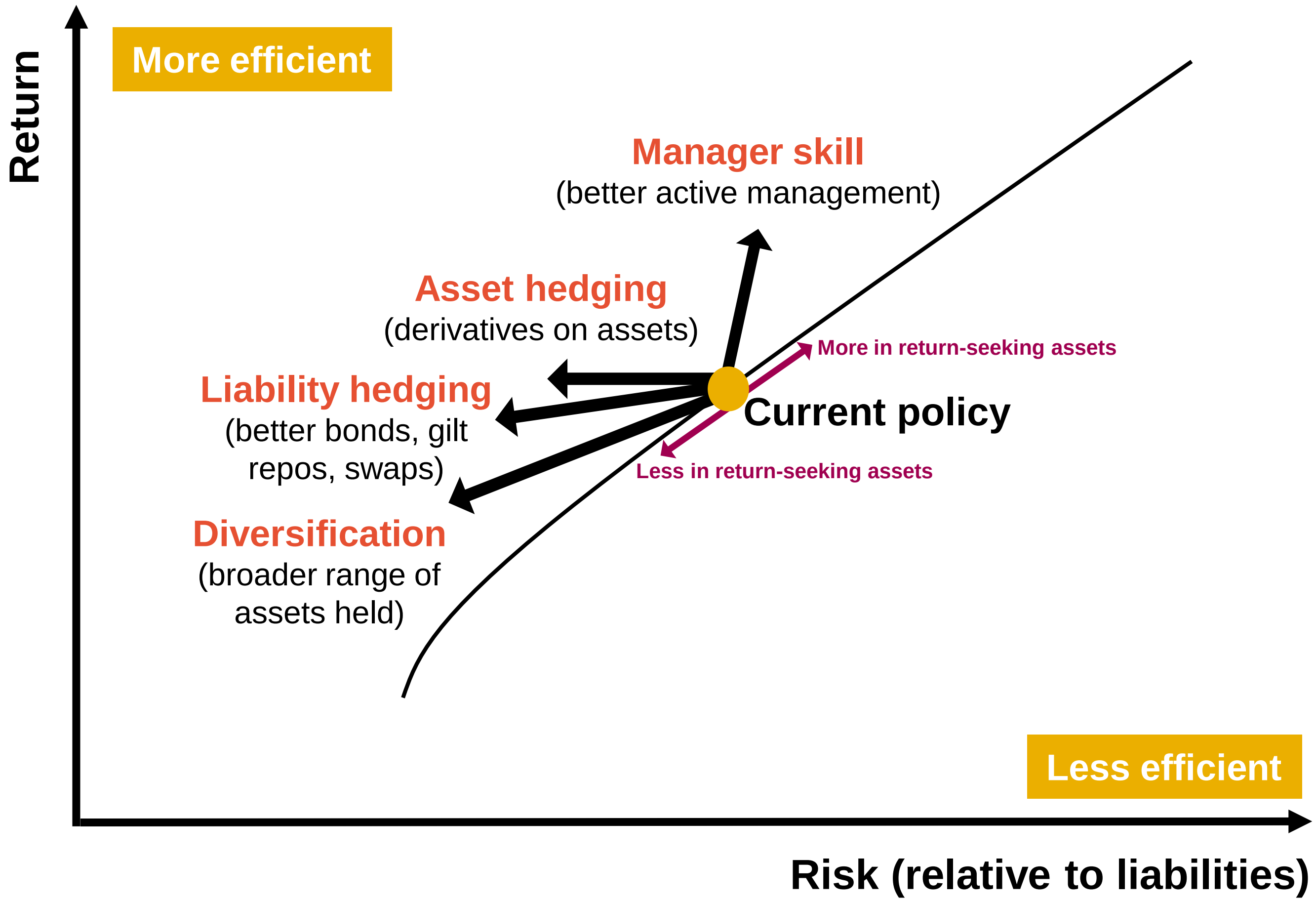


Being dynamic



Improving investment efficiency

Approaches to improve return per unit of risk



Diversity of risk premia

Decreasing driver weighting →

↑ Decreasing reliance on skill

Passive equity	ERP				
Commodities	Insurance				
Global RES	Time	Credit	ERP		
Emerging market currency	Currency				
IG corporate bonds - passive	Credit	Term	Inflation		
Nominal government bonds	Term	Inflation			
Index-linked government bonds	Term				
Loans	Credit	Time	Skill		
Reinsurance	Insurance	Skill			
Infrastructure	Time	Credit	Skill		
PE style illiquid funds	ERP	Skill	Time		
Emerging market equities	ERP	Skill			
Active equities	ERP	Skill			
High yield	Credit	Skill	Time		
ABS	Credit	Skill	Time		
Core property	Time	Skill	Credit		
EMD ($)	Credit	Skill	Time	Term	Inflation
Diversified hedge fund portfolio	Skill	ERP	Credit	Time	Insurance
IG corporate bonds - active	Skill	Credit	Term	Inflation	

Equity Risk Premium (ERP): The future earnings from companies are uncertain leading investors to demand higher returns as compensation

Insurance: Investors who are providing insurance to another party expect to be rewarded

Time: Investors will demand compensation for holding assets that cannot be quickly or cheaply sold

Credit: Bond issuers may default on their obligations and not make repayments of capital of interest and so must offer spreads over government bonds

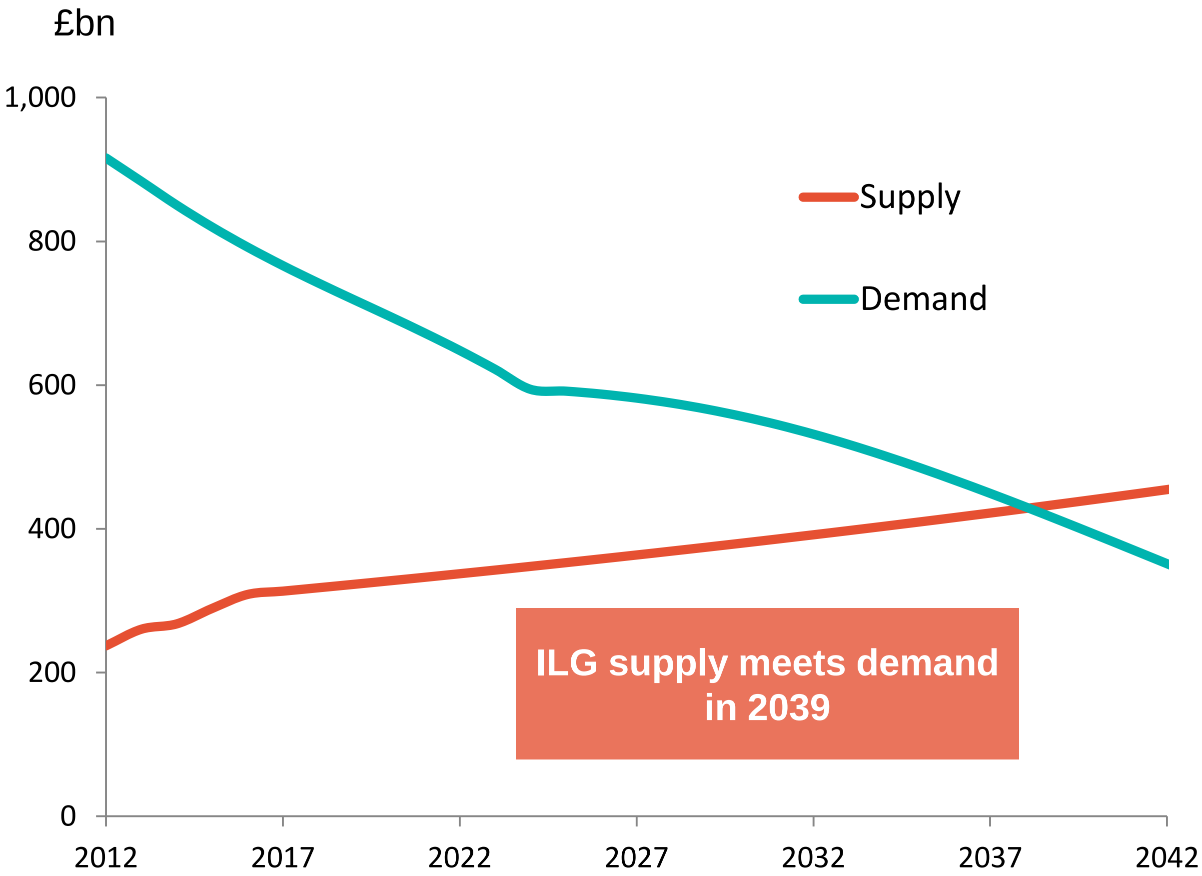
Term: Investors will require higher returns for holding index-linked bonds due to uncertain returns and mark to market volatility

Skill: Skilled investment managers may be able to outperform the average and generate 'alpha'

Inflation: Investors will demand higher returns to hold fixed interest bonds to compensate for the risk of inflation eroding returns

Currency: The risk that the purchasing power of the currency falls leads investors to demand compensation for holding assets in a different denomination

All pension funds need index-linked gilts…..



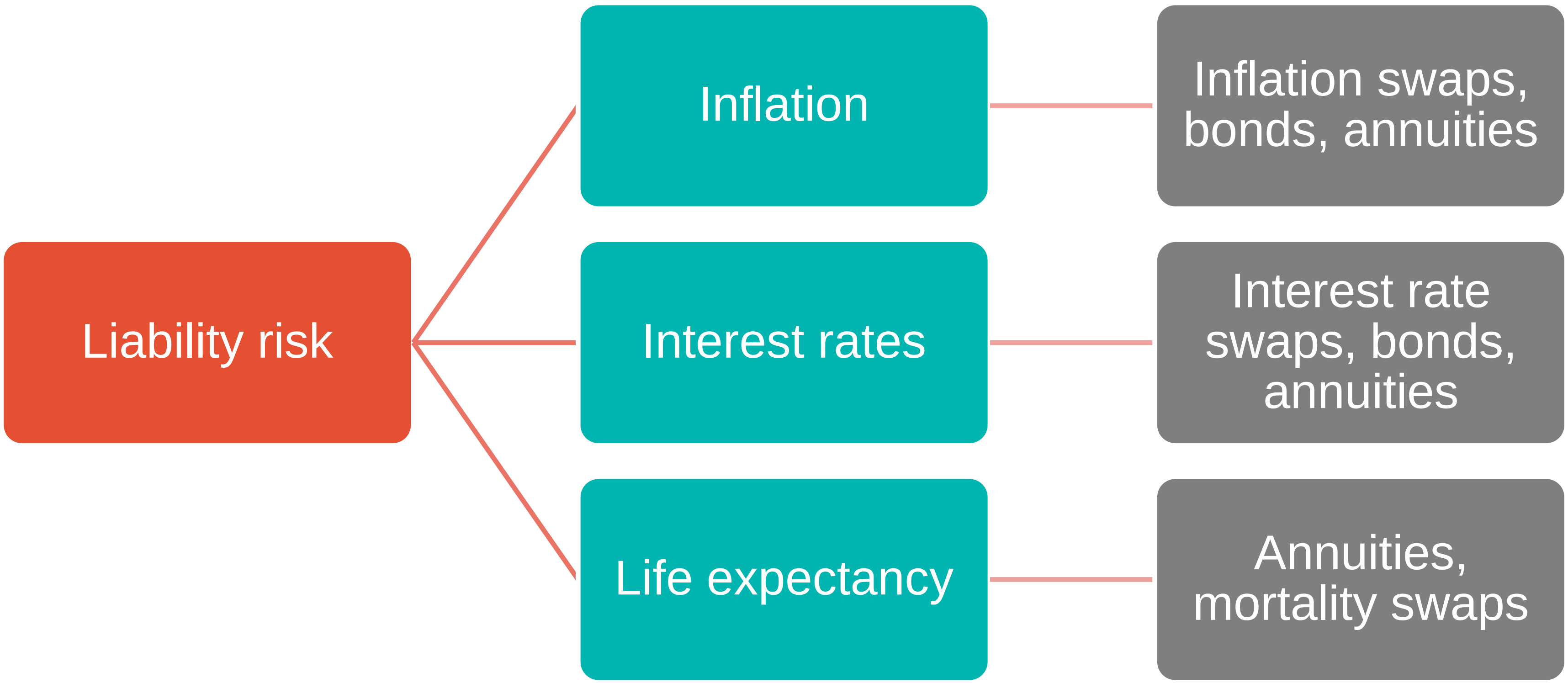
Dealing with this scarcity

1. Alternatives to ILG

Driver	Possible hedge
Commodity prices	Commodity futures
Shelter	Low risk inflation-linked property assets eg ground rents
Emerging market inflation	EM index-linked bonds
Global inflationary conditions	US TIPS
Sterling	Unhedged overseas assets

2. Alternative risk reduction
3. Be dynamic

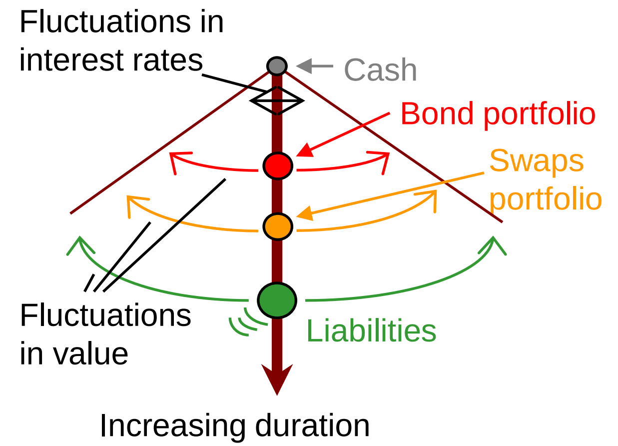
Risk management – the building blocks



Market measures of interest rate risk and inflation risk

Duration is a measure of sensitivity to changes in interest rates

- Measured in years
- Can be thought of as the average time to payment by value
- For example, long duration liabilities suggest that there are many years until payment and so very high sensitivity to changing interest rates



PV01 is the market standard measure of sensitivity to changes in interest rates: IE01 for inflation

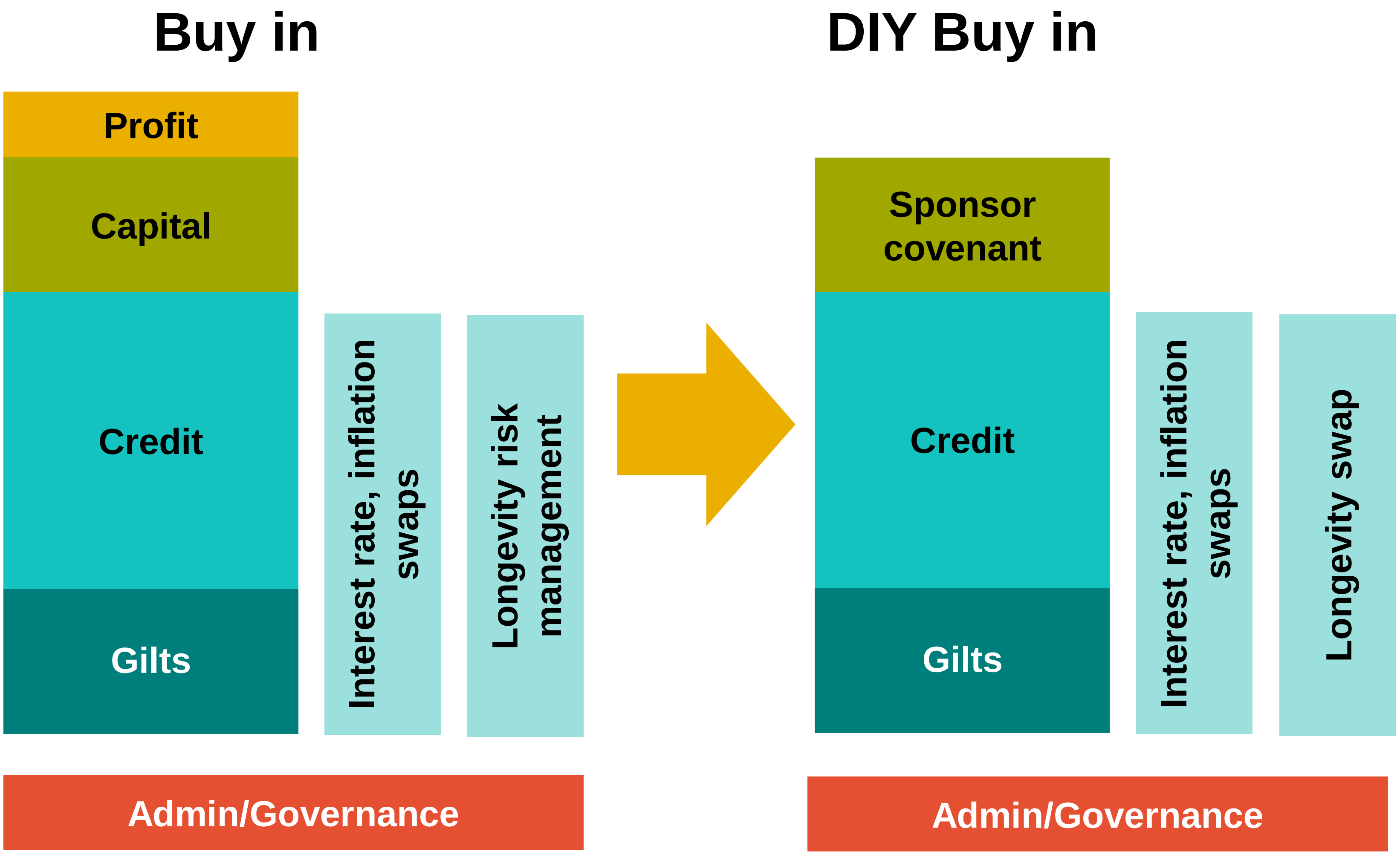
- A market standard measure of interest rate risk
- Combines both duration and value
- It represents the change in the market (present) value of an asset or liability to a 1bp (0.01%) change in interest rates at all maturities.

PV01 = Duration x Value / 10,000

Instruments

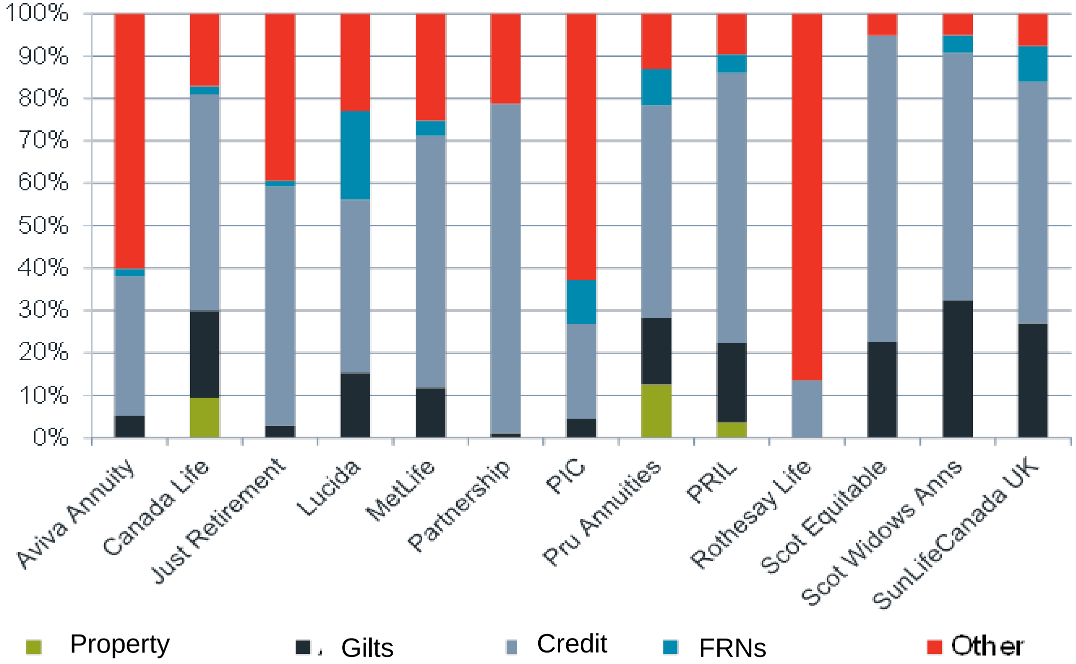
- Gilts, credit, derivatives (swaps, repo, TRS)

The low risk target



What should my portfolio look like “when I get there”?

Typical annuity provider investment strategies



(Source: FSA)

Summary

- DB pension funds are "legacy arrangements"
- Pension fund investment has got harder….and is competitive
- A long term plan is key….as is being dynamic along the way
- Your ultimate portfolio might not be quite what you think

Supporting Material

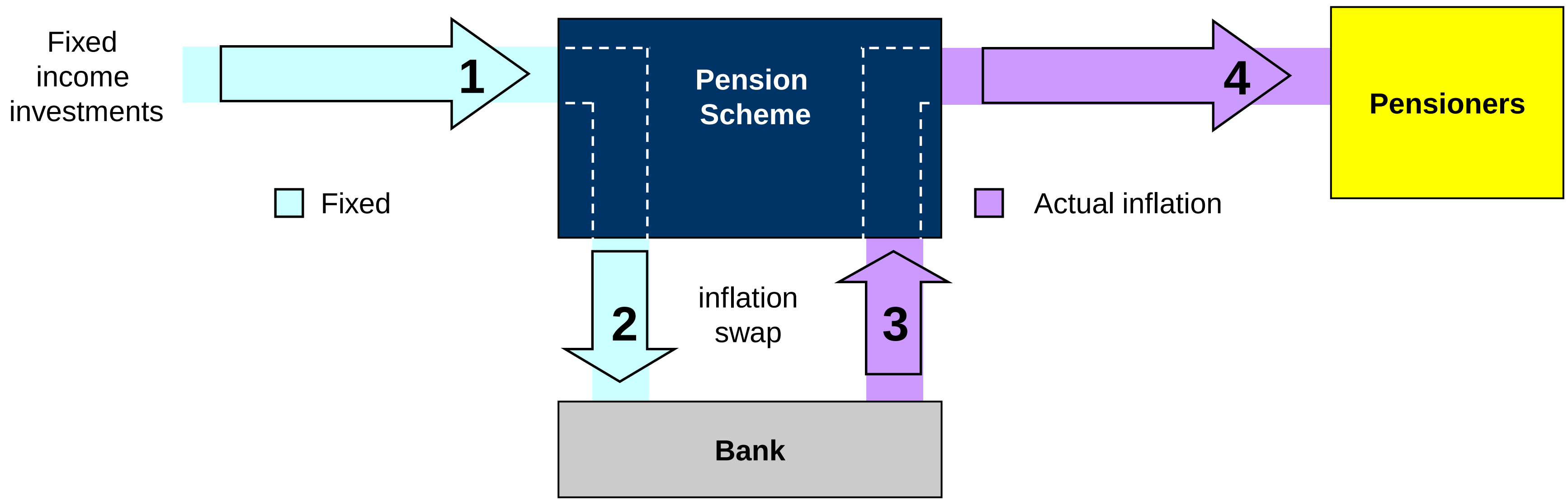
Inflation swap mechanics

An inflation swap exchanges fixed payments for payments linked to an actual rate of inflation

Given that the actual rate of inflation is not known in advance, an inflation swap enables a pension scheme to reduce the uncertainty in paying its inflation linked liabilities.

The diagram below illustrates the flow of payments in a structure how an inflation swap may be used in practice by a pension scheme:

1. Fixed payments from **fixed** income investments
2. Payments linked to a **fixed** rate
3. Payments linked to an **actual inflation** rate (RPI)
4. Pension payments also linked to **actual inflation** rate (RPI)

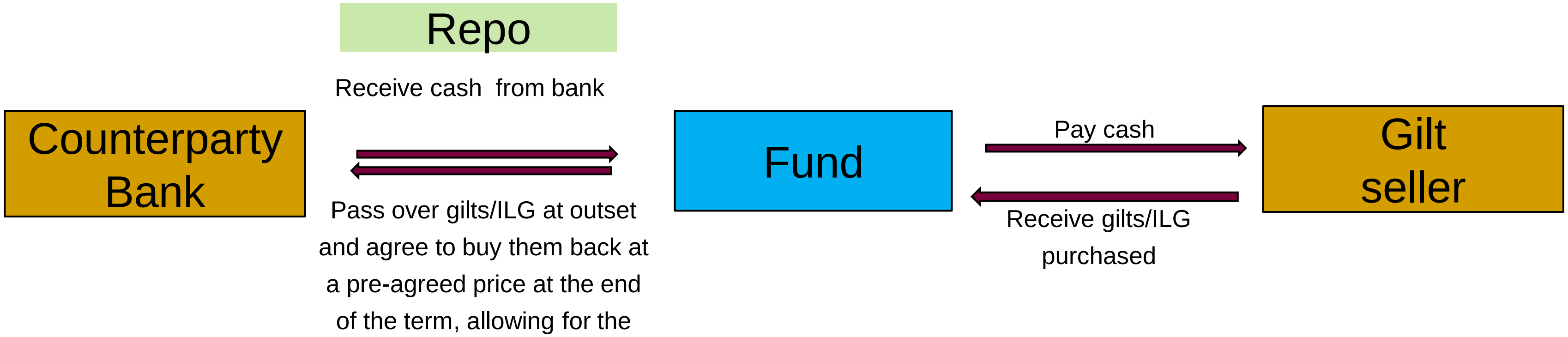


An inflation swap transforms an inflation linked liability into a fixed liability

Repurchase agreements (Repo)

Repos allow pension schemes to gain leveraged exposure to gilts without upfront commitment of capital

- Repo, also known as a “sale and repurchase agreement” allows a pension scheme to achieve the same economic effect as raising cash from a bank against the scheme’s gilt holdings (at a funding rate known as the “repo rate”)
- In such agreements the scheme agrees to sell gilts to a counterparty bank and agrees to buy back the same gilts from the counterparty bank at a pre-agreed price at some later date whilst retaining the economic exposure of the gilts sold under the repo agreement.
- Therefore, repo allows the Scheme to gain leveraged exposure to gilts without full upfront commitment of capital
- The benefits of leveraged exposure is that the cash can be used for alternative opportunities, such as gaining further hedging exposure
- The diagram below illustrates a repo transaction

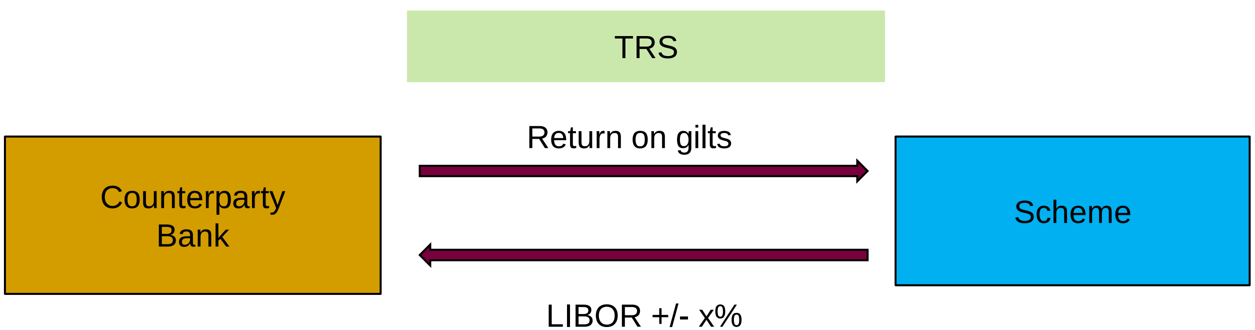


Repo allows a scheme to hedge liabilities with gilts (rather than swaps)

Total Return Swaps (TRS)

A total return swap achieves a similar objective to repos in providing exposure to gilts without upfront commitment of capital

- A total return swap ("TRS") is an "over the counter" derivatives contract that will deliver the "total return" on a particular asset (over a specified period of time), in return for a LIBOR related payment based on the size of the exposure referenced in the contract.
- In the context of liability hedging, a pension scheme would use gilt TRS to access gilts yields synthetically (i.e. without actually purchasing the gilts themselves).
- At a high level, the scheme would be required to pay a pre-agreed interest rate (linked to LIBOR usually) on an agreed sum and in return will receive the total return on a pre agreed portfolio of index-linked gilts.
- As long-term interest rates move, the payments due from the scheme to the counterparty remain unchanged, however, the return on the index-linked gilts will change to reflect the change in long term rates.
- TRS can only be executed as contracts with maturities of up to 3 years. Therefore there are similar issues regarding settlement and roll risk as with a gilt repos.
- The diagram below illustrates a gilt TRS trade.



A TRS allows a scheme to access gilts exposure without upfront capital commitment

Glossary of terms

The discussion brings with it a set of terms that may be new including:

- **Duration** – a measure of the sensitivity of the value of a cashflow to changes in interest rates, expressed in years.
- **PV01** - PV01 is the change in present value of the assets/liabilities for a 0.01% pa (1 bp pa) change in the relevant interest rates.
- **RPI** – the UK Retail Price Index. This is a measure of the change in consumer prices as published by the Office of National Statistics.
- **LPI** – limited price indexation. For example annual LPI(0,5) is the rate of inflation (change in RPI) annually floored at 0% and capped at 5%.
- **Real yield** – the yield on inflation linked assets (in excess of inflation).
- **Inflation volatility** – a measure of the likely change in the inflation rate over a year i.e. high inflation volatility indicates that the rate of inflation could change significantly within one year.
- **Swap** – legal contract to exchange a series of cashflows.
- **Marking to market** – the process of calculating the market value of a derivative.
- **Collateral** – assets handed over as security against expected future cash payments.
- **LIBOR** (London Inter Bank Offered Rate) – the rate of interest at which banks lend each other money. This rate is termed floating as it changes on a daily basis.
- **ISDA** – legal agreement under which swap contracts are executed. These agreements are based on a framework agreed by the International Swaps and Derivatives Association.
- **GMRA** – Gilt Master Repurchase Agreement. These are standardised legal agreements governing gilt repo legal arrangements.

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