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Standard Life Investments

Liability Driven Investment

- Liability Driven Investment
  - Drivers
  - Definition
- Case Studies
  - Pooled client highlights trustee communication issues
  - Segregated
- Suggested issues for our discussion

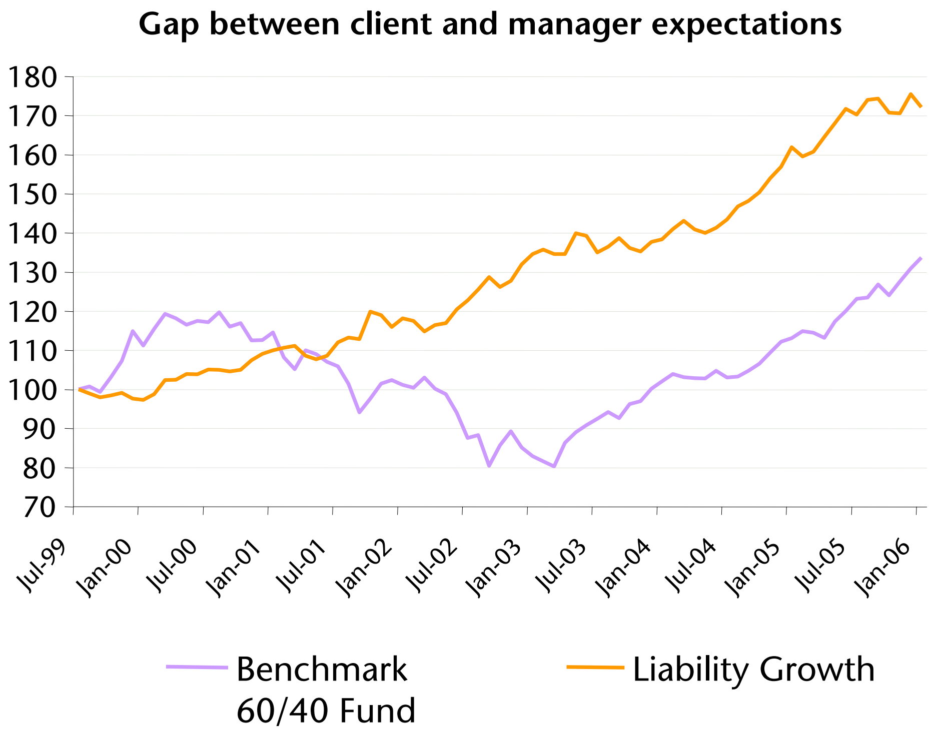
The pensions world has changed

- History
  - Young pension schemes
  - Majority of benefits discretionary
  - Opaque accounting of pensions' costs
  - Bull equity markets

- Now
  - Pensions schemes maturing
  - Most benefits guaranteed in nature
  - Transparent pension accounting highlight short term asset mismatches
  - Living in the aftermath of an equity bear market

Why the status quo is no longer a valid model

The imperative for change



Source: Standard Life Investments

- Falling equity markets and interest rates have caused deficits for many schemes
- Classic investment mandates are not designed to prevent these deficits
- Strategic Asset Allocation ignored short term mark-to-market surplus/deficit
- New thinking on risk management is not limited to funds in deficit – eliminate unrewarded risk

Disconnect between the investment target and the liabilities

Traditional process

ALM Study

Scheme Actuary, Investment Consultants

Manager Selection

Investment Consultants

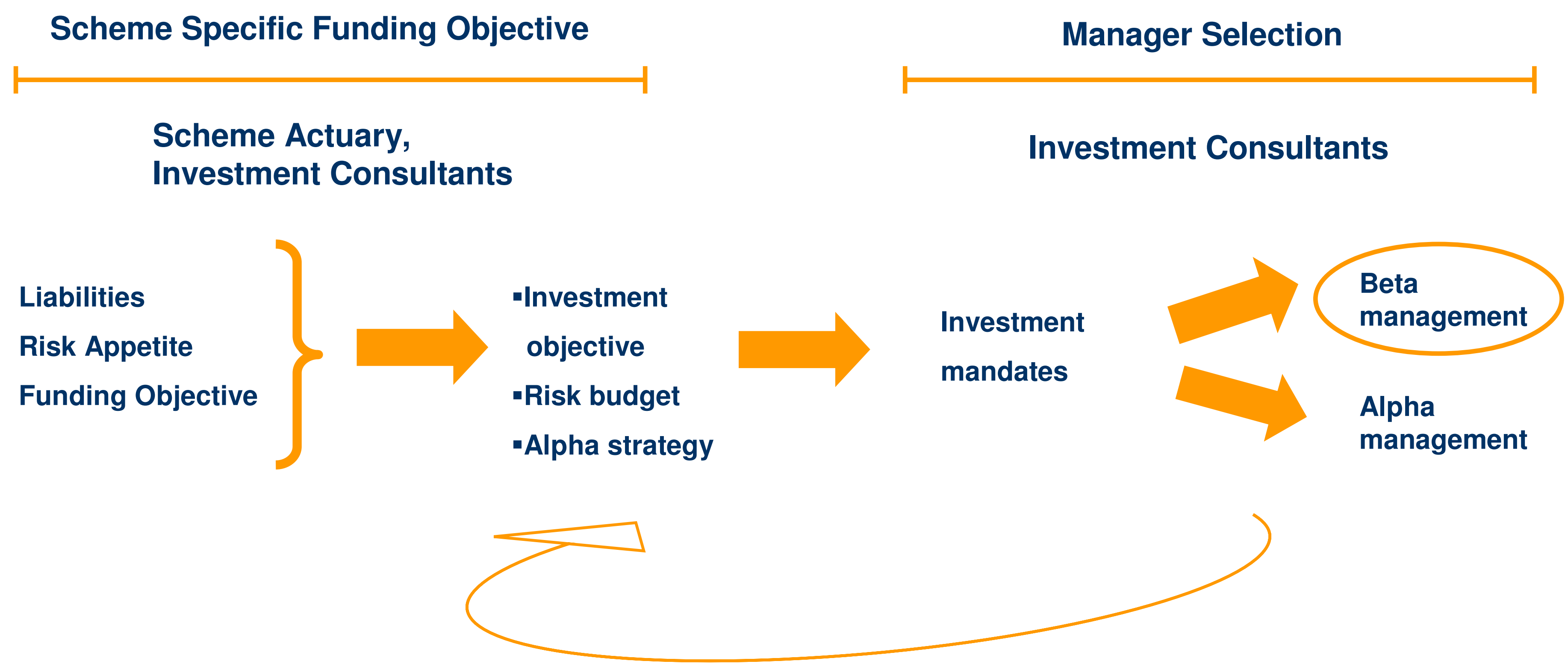
Liabilities
Risk Appetite
Long-term view of
Asset returns

→ **Strategic Asset Allocation** → **Investment mandates for each asset class** → **Alpha management**

Timescale: 10-20 years | 1-3 years

Disconnect between scheme objectives and asset management

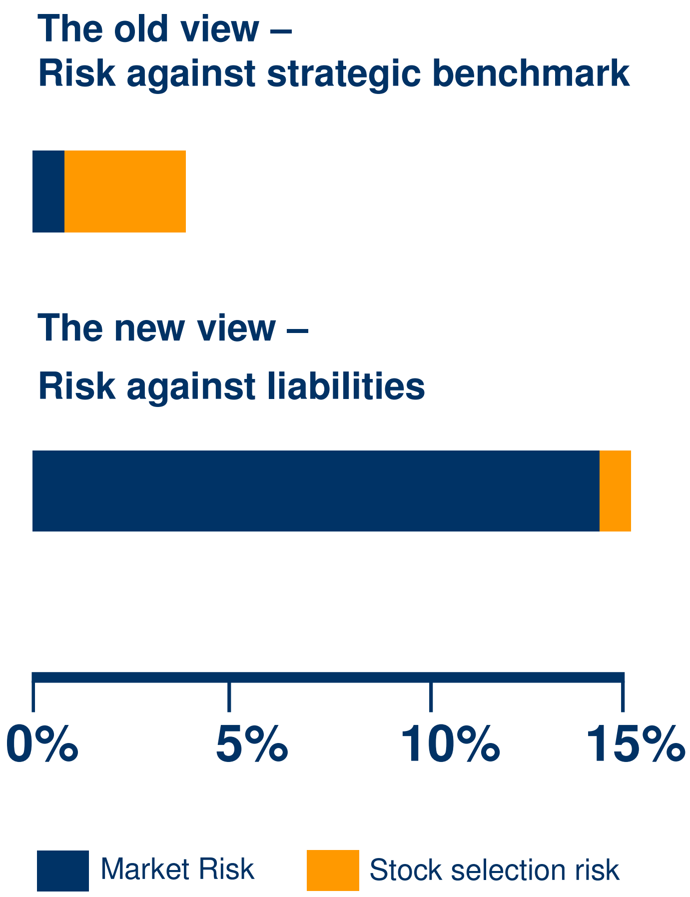
Liability driven process



Timescale: 3-5 years

Continuum established between liabilities and assets

The Advent of Liability Driven Investment



- In the old view stock selection risk dominates
- In the new view market risk dominates
- Active management does not materially increase tracking error versus liabilities

Liability Driven Investment is the active management of Market Risk

Understanding trustees' objectives

- Generate excess returns to
  - Meet / exceed valuation interest rate
  - Improve security
  - Pay for discretionary benefits
- Stabilise funding level
  - Eliminate/reduce unrewarded risk
- A smoother route to a higher funding levels than a traditional approach

LDI is for improving funding and reducing volatility
NOT "locking-in a deficit"

Integrated return and risk management solutions
Pooled: Case Study 1

- Aligned to investors sub £100m
- Pooled structures to reduce implementation effort
- Adaptable over time

Proposal to meet requirements

- Requirements:
  - Out-perform liabilities by 2.5% per annum
  - Reduced balance sheet volatility
  - Retain some interest rate exposure (minimise regret risk)

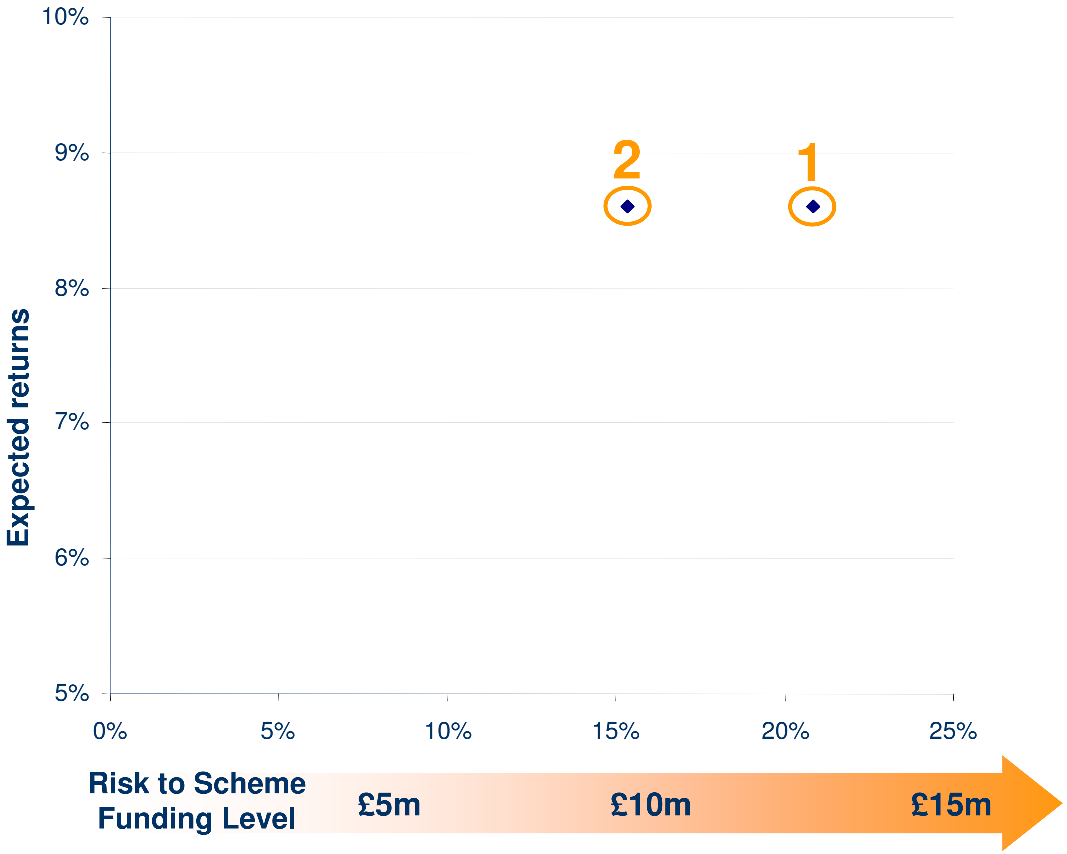
- To fulfil objective 1 (return seeking):
  - Absolute Return target – similar to equities
  - Highly diversified – low volatility target
  - Dynamic Asset Allocation to maximise returns for given risk

- To fulfil objective 2 (risk mitigation):
  - Tailored bonds plus swap overlay to reduce volatility

A strategy that adds value and reduces volatility

Objective 1: Delivering return

Analysis: Return versus Risk for your Investment Options

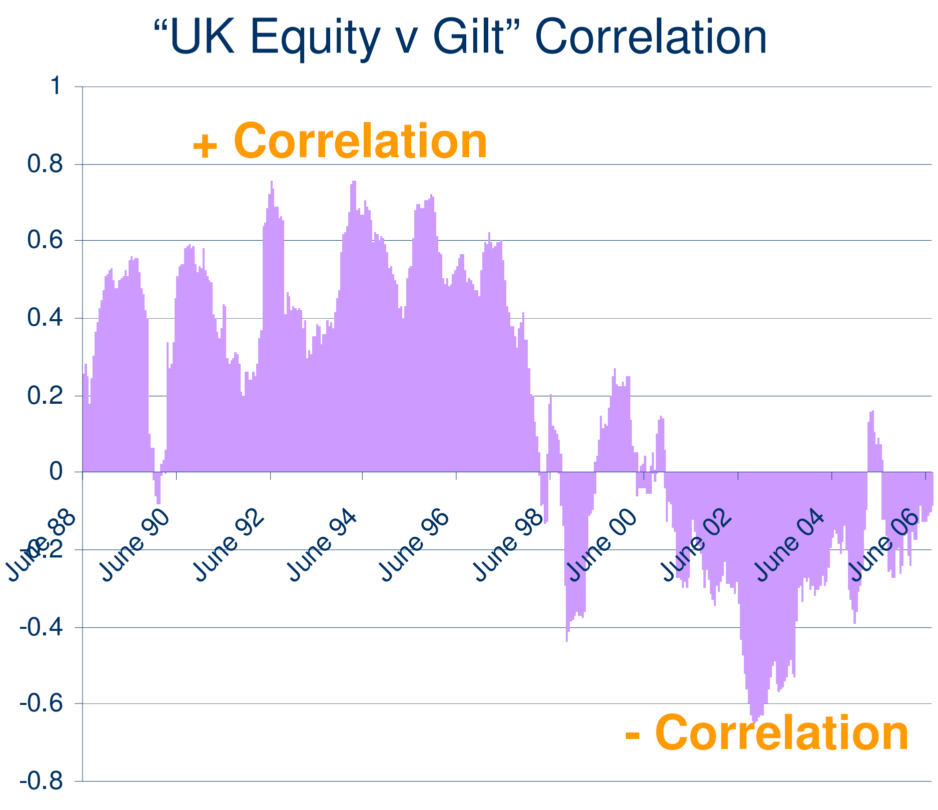


1 Equity portfolio

2 **Absolute Return Strategies replacing the equity component**

Reduced volatility for same return

Why dynamic asset allocation



Source: Standard Life Investments

- The degree of correlation between assets changes over time
  - The benefits of diversification can wax and wane between asset classes
  - The risk in a static portfolio therefore rises and falls

- Dynamic Asset Allocation
  - Holds diversified positions
  - Avoids those that become correlated
  - Pro-actively changes the assets held

Dynamic Asset Allocation stabilises investment risk over time

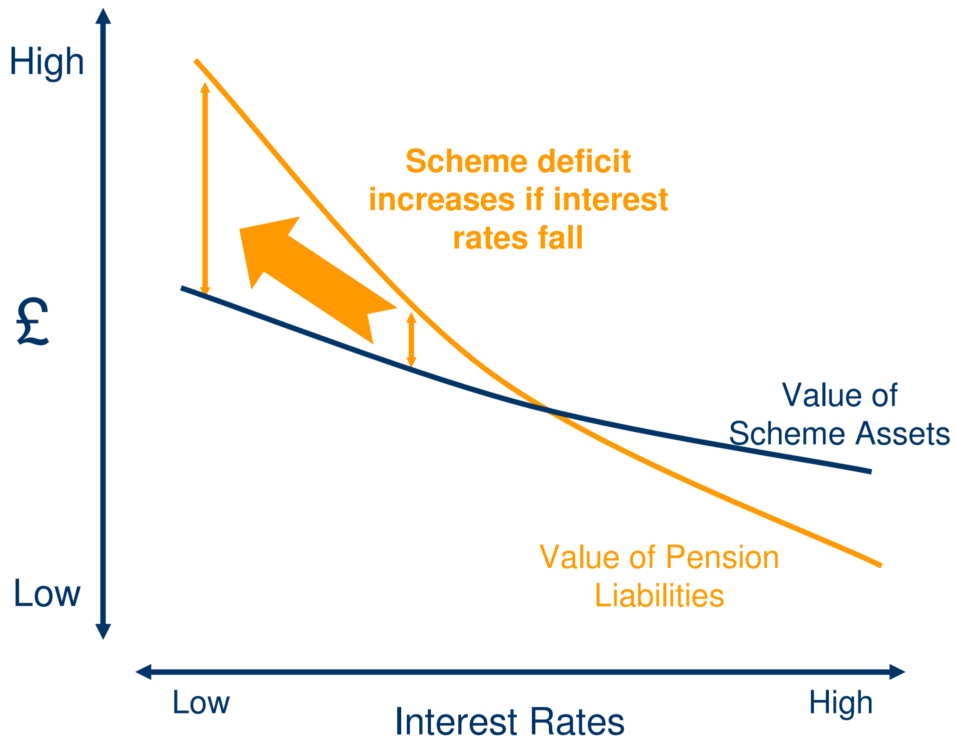
Objective 2: Interest Rate Risk Mitigation

- 50% invested in a pooled corporate bond fund that meets the duration requirements
  - Targets the scheme liability profile to reduce unrewarded risk

- Also benefit from
  - An additional yield over gilts
  - Expertise in active corporate bond management
  - Pooled fund ease of implementation
  - Flexibility to adjust the investment as time passes

A strategy that adds value and reduces volatility

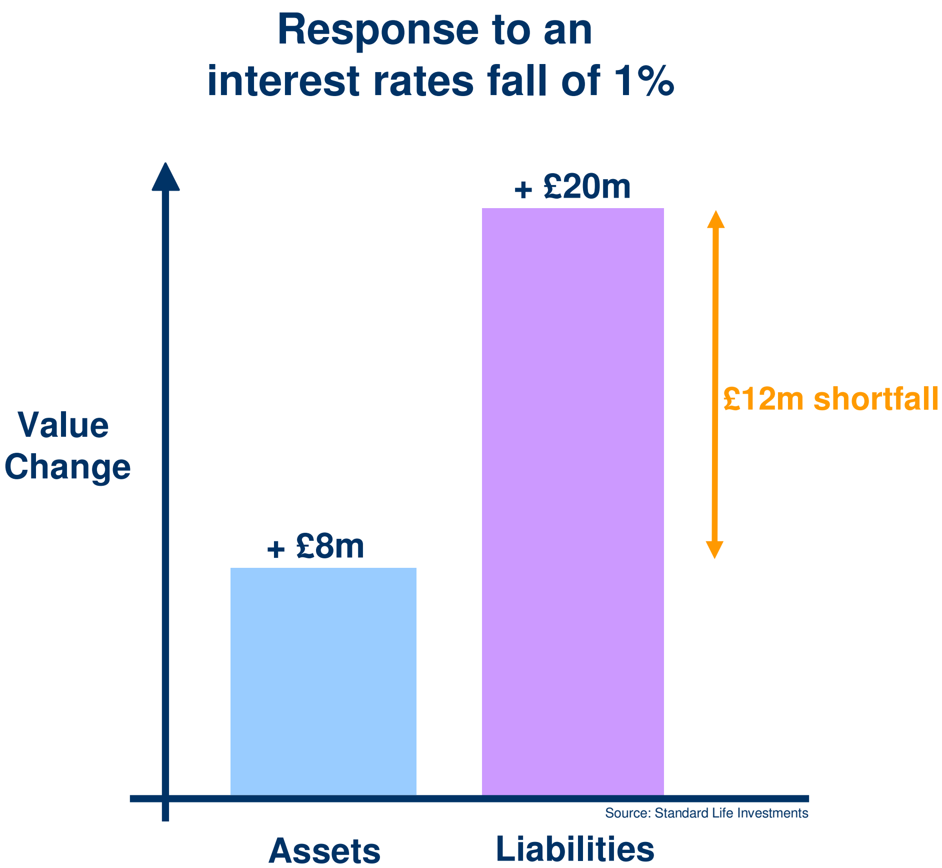
“Modified Duration” – Interest rate sensitivity



- Small changes in interest rates are amplified in their effect on Assets and Liabilities
- The value of Assets and Liabilities often change by very different amounts making funding volatile
- The rate at which the value changes is measurable and called “Modified Duration”
- There are investment strategies to limit the difference between Assets and Liabilities (immunisation).
- These strategies reduce funding level volatility

Measuring the impact of interest rate movements

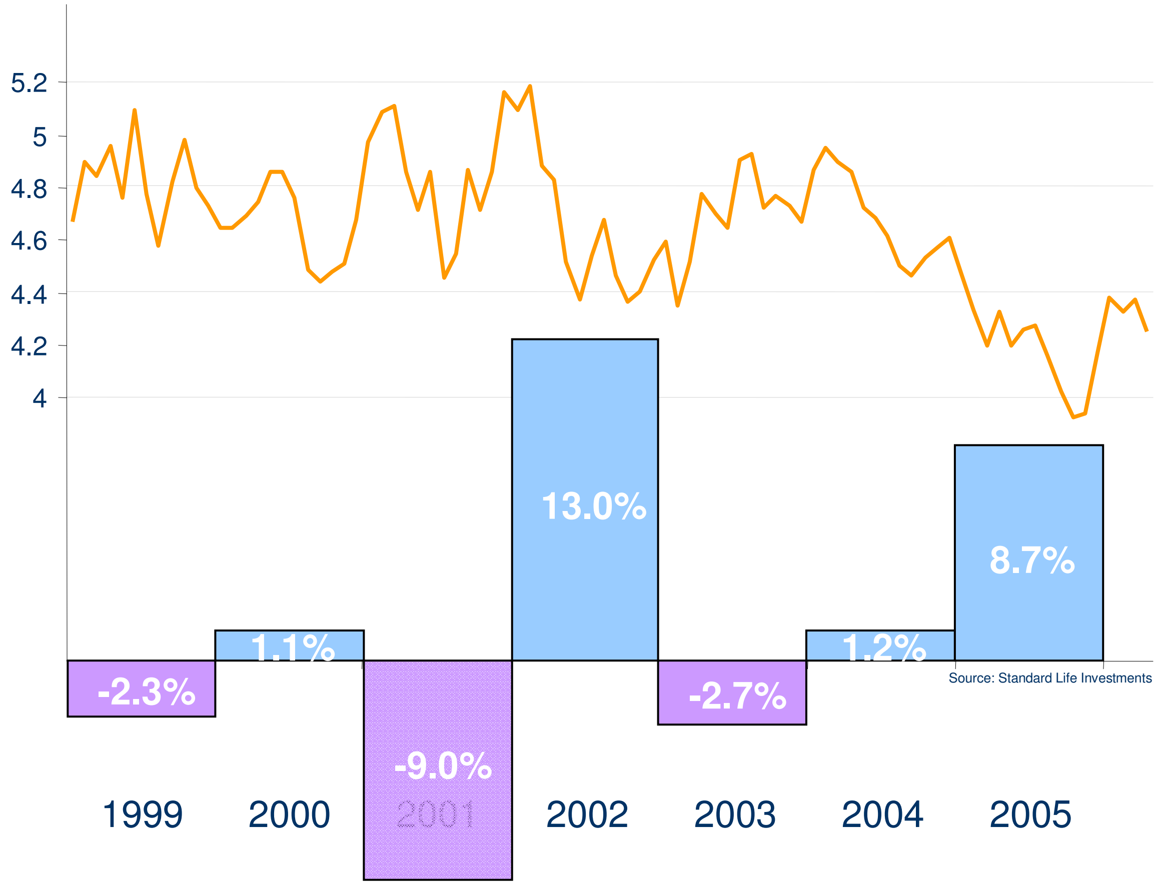
Exposure to interest rate risk



- Changes in interest rates can affect Asset and Liability values differently making funding volatile
  - This is called **duration**
- Liabilities have duration 20 say, so if interest rates fell by 1% the value of every £100m of liabilities would increase by 20% or **£20m**
- If assets also have duration 20….
  - Movement of assets and liabilities aligned
  - Traditional volatility removed
- Investment issues
  - Bonds have known duration
  - Traditional bond funds have only duration 8 or 13

Important to meet duration requirements

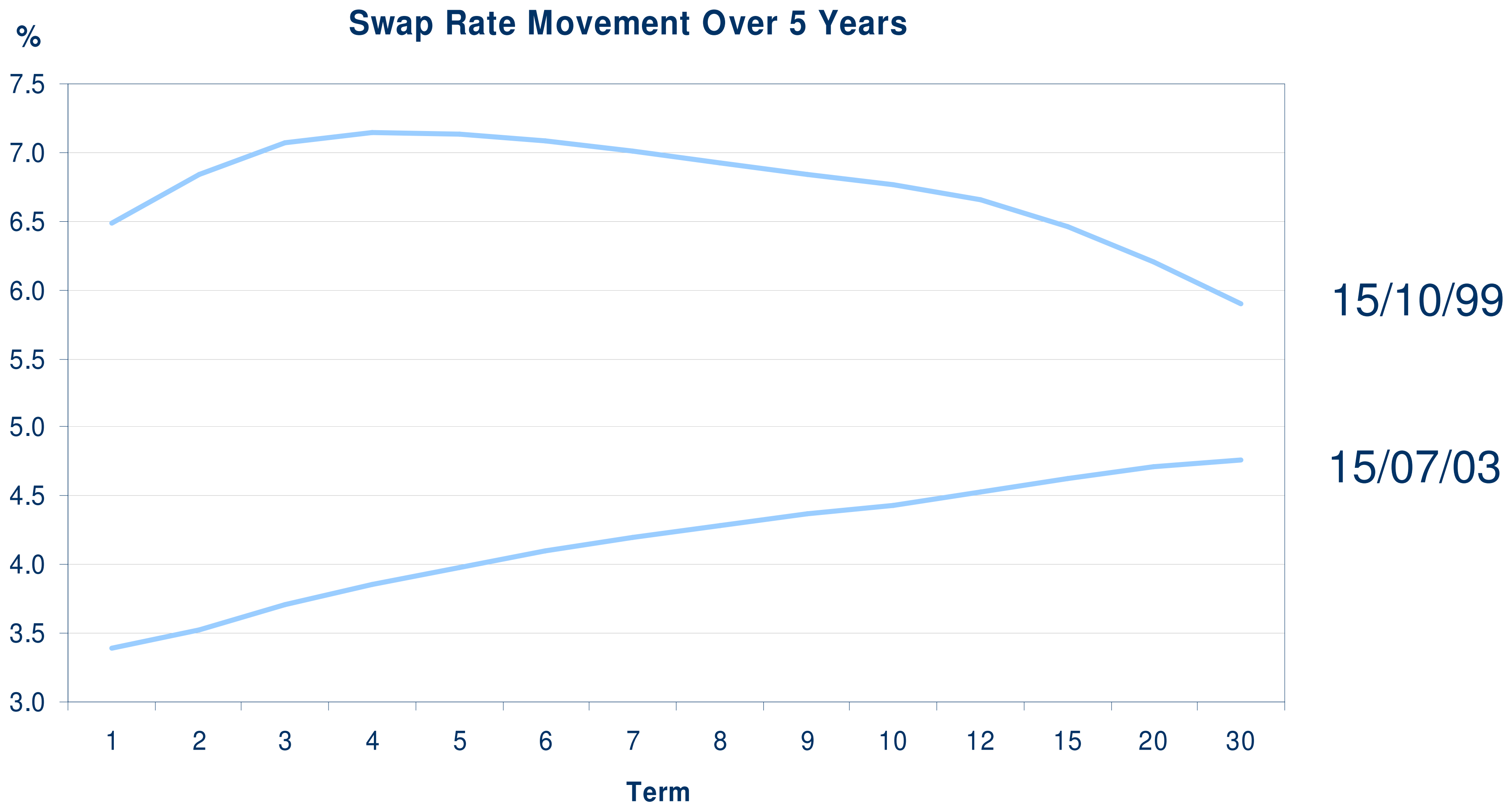
Recently…



- Based on Liabilities with 20 year duration
- Bars represent the change in **Liability Value** over each financial year
- Growth in liabilities since April 2002 is over 20%

Exposure to interest rates is a prime source of risk

Movement in interest rates



Source: Standard Life Investments

An optimum reward approach

1 Your current portfolio

2 **AR Strategies** comparison to equities

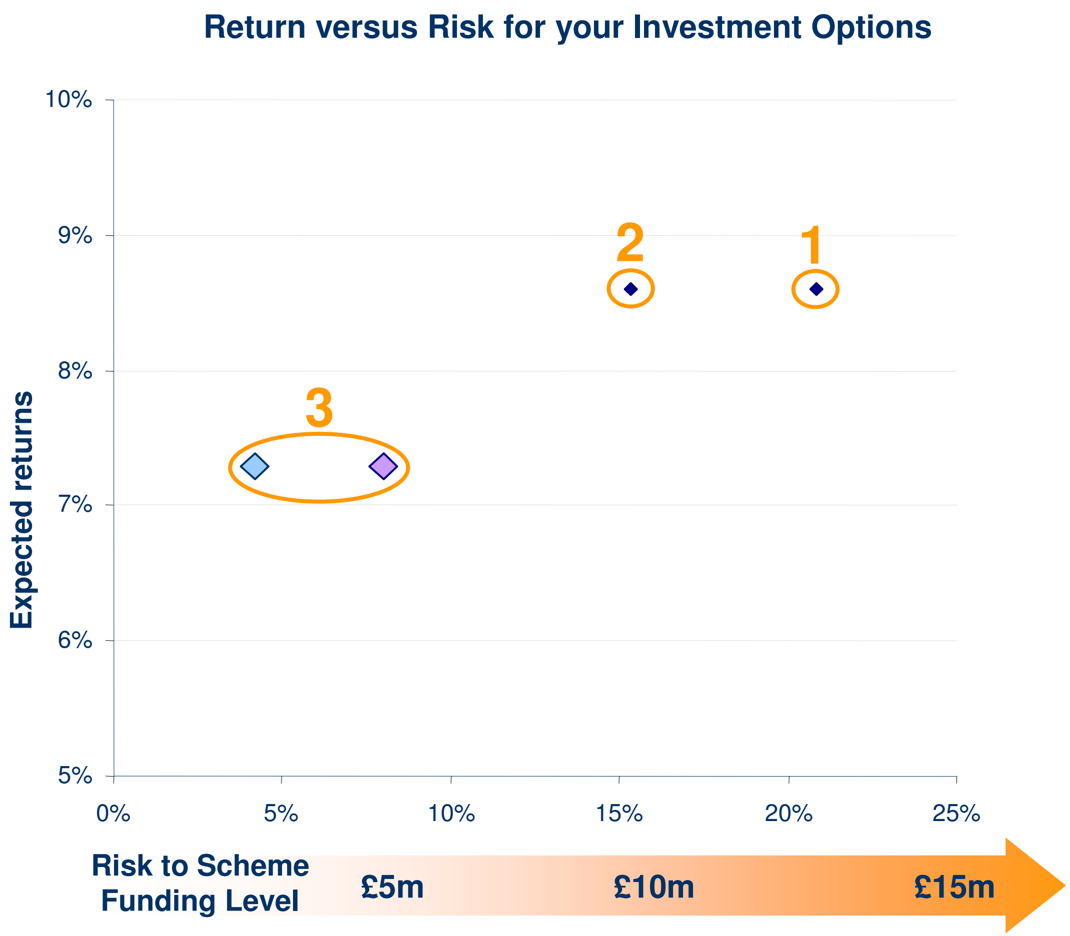
3 **Meet Liabilities + 2.5% return target**

◇ 50% ARS and 50% Credit Fund (duration 20)

Swap execution cost: <40bps, £240k

Return target met with reduced volatility

Further reducing risk



1 Your current portfolio

2 **AR Strategies** comparison to Equities

3 **Meet Liabilities + 2.5% return target**

- 50% ARS and 50% Credit Fund (duration 20)
- 50% ARS and 50% Credit Fund (duration 40)

Return target met with reduced volatility

Integrated return and risk management solutions
Case Study 2

- Aligned to sophisticated investor needs

- Segregated structures permit various modes of interaction with other scheme advisers

- Implementation assistance

Overview of Approach

- Liability definition based on projected annual cashflows
  - Nominal and Real
  - Supplied annually
- Agreed valuation basis
  - swap curve used to reduce basis risk in the investment process
- £1bn Dynamic Asset Allocation mandate
  - target liabilities +2.3%
  - 3 to 5 year time horizon
- Agreed further constraints:
  - Total tracking error
  - Diversity constraints

Customisation to client needs

Further Constraints / Detail

- Fund risk restrictions:
  - Volatility maximum 8.6%
  - Market Return Strategy risk limit, 40% of aggregate stand-alone risk
  - Sub-strategy limit, 30%
  - Counterparty credit quality

- Hedge overlay to translate returns to liabilities
  - Based on principle components
  - Active duration / inflation hedging overlay for £750m (75% maximum hedge position)
  - Discretion on implementation (over several months for inflation)

- Quarterly reporting
  - Detailed risk and return attribution

Suggested issues for our consideration

- Governance burden
- Issues as a result of derivatives use in portfolios
  - Gearing - How is it defined? Is it problematic?
  - Reporting - Risk Exposure, Attribution of Risk and Return
- Overlay implementation best practice
  - Process
  - Best execution

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