



A presentation *from* **BARCLAYS GLOBAL INVESTORS**

Implementing an LDI framework Portable alpha

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Agenda

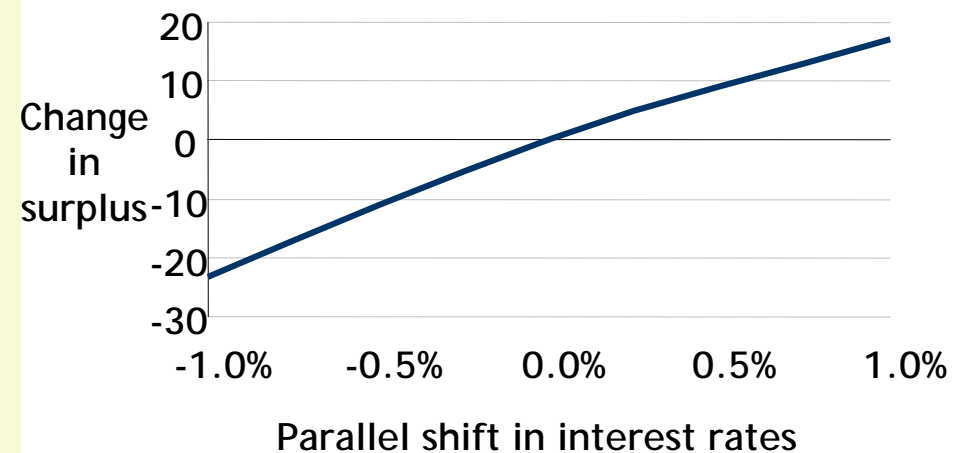
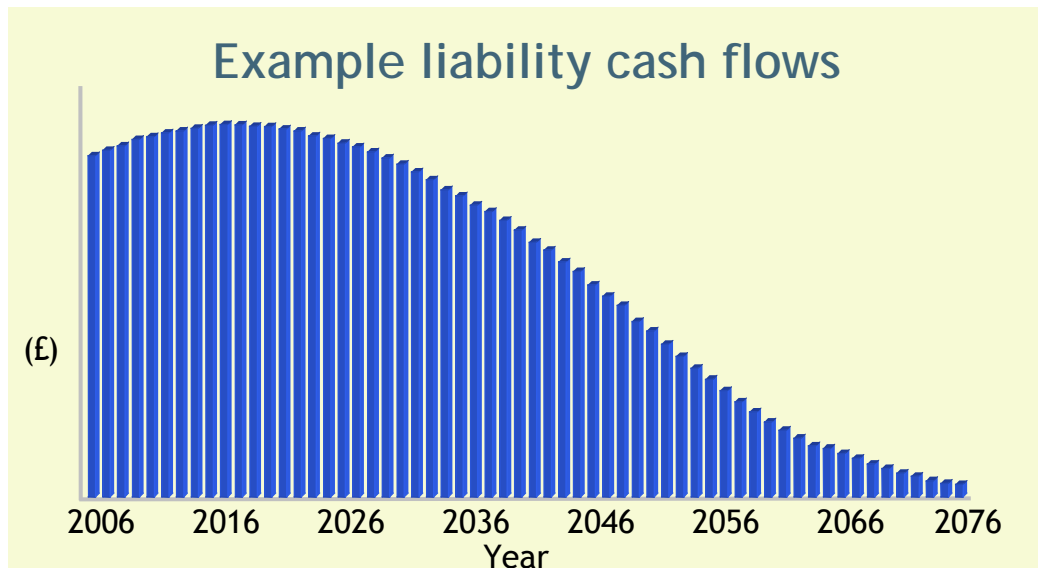
Constructing liability driven investment solutions

- Context
 - Pension plan liabilities
 - Investment risk in context of liabilities
- Risk budgeting
 - Risks to hedge, risks to take
 - Alpha and beta - approaches and products
 - The alpha beta decision revisited

Pension scheme risks

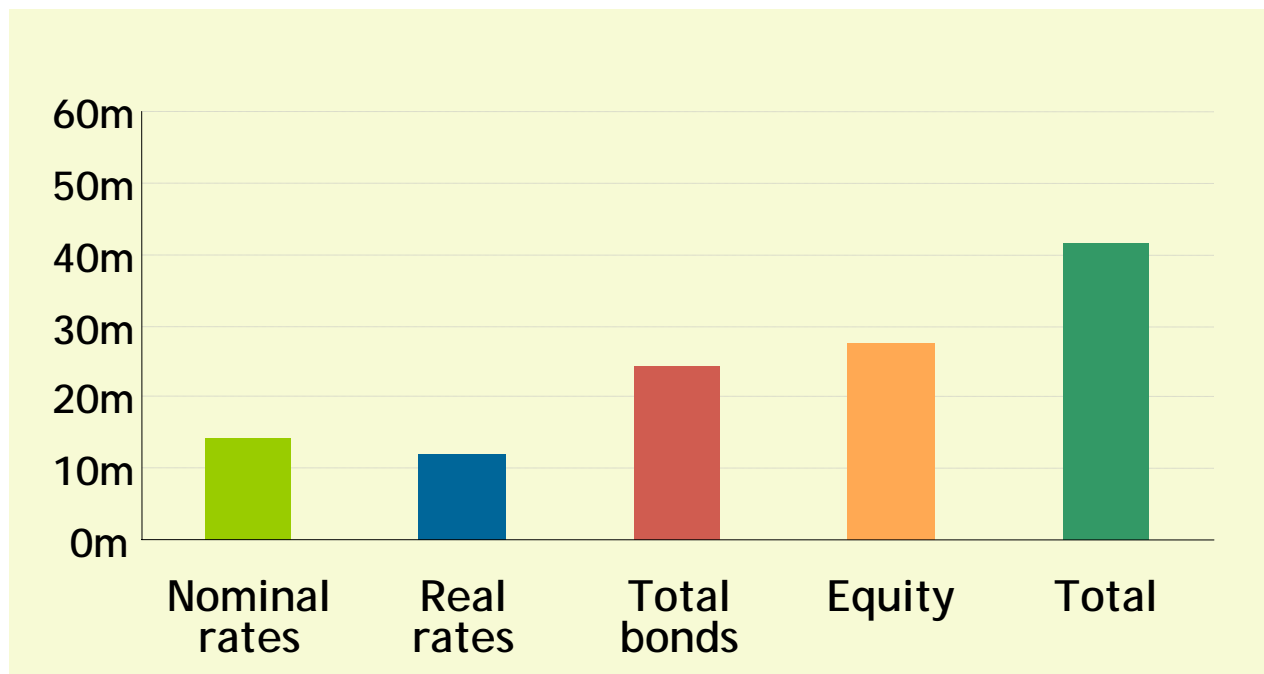
Start with the liabilities

- Liabilities are future cash flows dependent upon:
 - Longevity
 - Inflation
 - Scheme demographics (leaver rates, salaries etc.)
- Value of liabilities also depends on interest rates



Sources of risk – current strategies

- Main risks in portfolio: interest rates and equities
 - Fall in interest rates of 40 basis points* leads to 24m increase in deficit
 - Fall in equities by 14%* will lead to 28m increase in deficit



* Roughly 1 standard deviation, ie approximately a 1 year in 6 event

Corporate finance theory (Black et al)

- Risk & return in pension plan passes through to corporate sponsor
 - So treat plan as part of the corporate balance sheet
 - Liabilities are now like corporate debt
- Efficient investment strategies?
 - Modigliani-Miller tells us to focus on 2nd order effects
 - E.g. Sponsor should maximise value of the tax shelter & value of default option

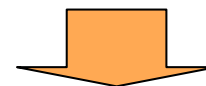
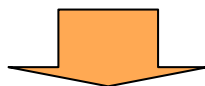
LDI – practice

- Corporate finance point of view routinely ignored
 - Although wider view does inform the risk budget
 - Seek to trade off return & risk at the scheme level
- Risk / return trade off
 - Markowitz / Sharpe efficient frontier etc
 - ...plus active management

Liability Driven Investment = spending the risk budget wisely

Investment ground-rule #1

Hedge unwanted exposures & target desired exposures



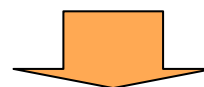
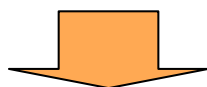
- Some risks *are relatively unrewarded*
 - Currency risk
 - Duration risk
- So don't take these risks unless forced
- Eg investing in foreign equities:
 - Introduces currency risk
 - Full or partial hedging can reduce impact
- Eg having pension liabilities:
 - Introduces exposure to interest rates and inflation
 - Hedge to reduce to a tolerable level

- BUT many risks *are rewarded*
 - Equity investment
 - Property, commodities, credit etc
 - Active management (but pick carefully!)
- Aim is to reduce volatility and retain return

Liability Driven Investment = spending the risk budget wisely

Investment ground-rule #2

To increase investment efficiency, the goal is to increase breadth



“Beta”
returns

- Breadth of sources of return
 - Reduce reliance on ERP by including other sources of economic return
 - Commodities
 - Credit

- Breadth within sources of return
 - Reduce concentration bias
 - Equities
 - Property?
 - Credit?

“Alpha”
returns

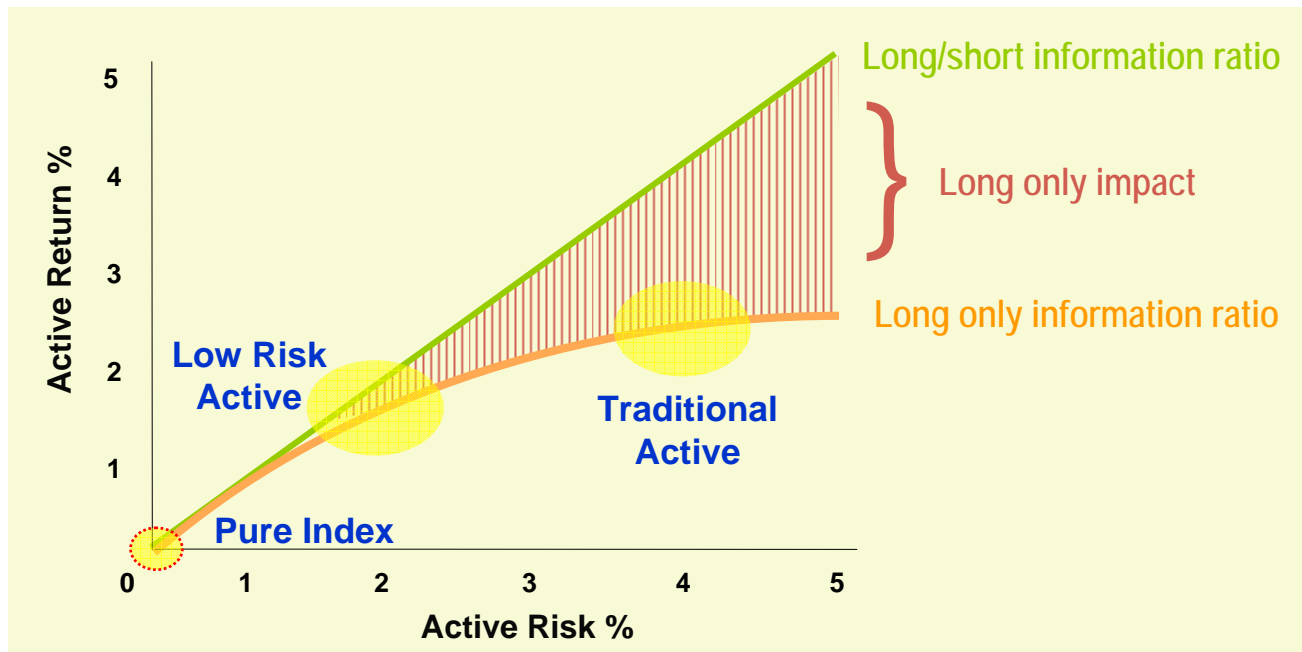
- Add exposure to ‘skill’ - ie active management

- Remove constraints within active management
 - Long only constraint
 - Use of derivatives

Minimising long only impact

Efficient use of risk

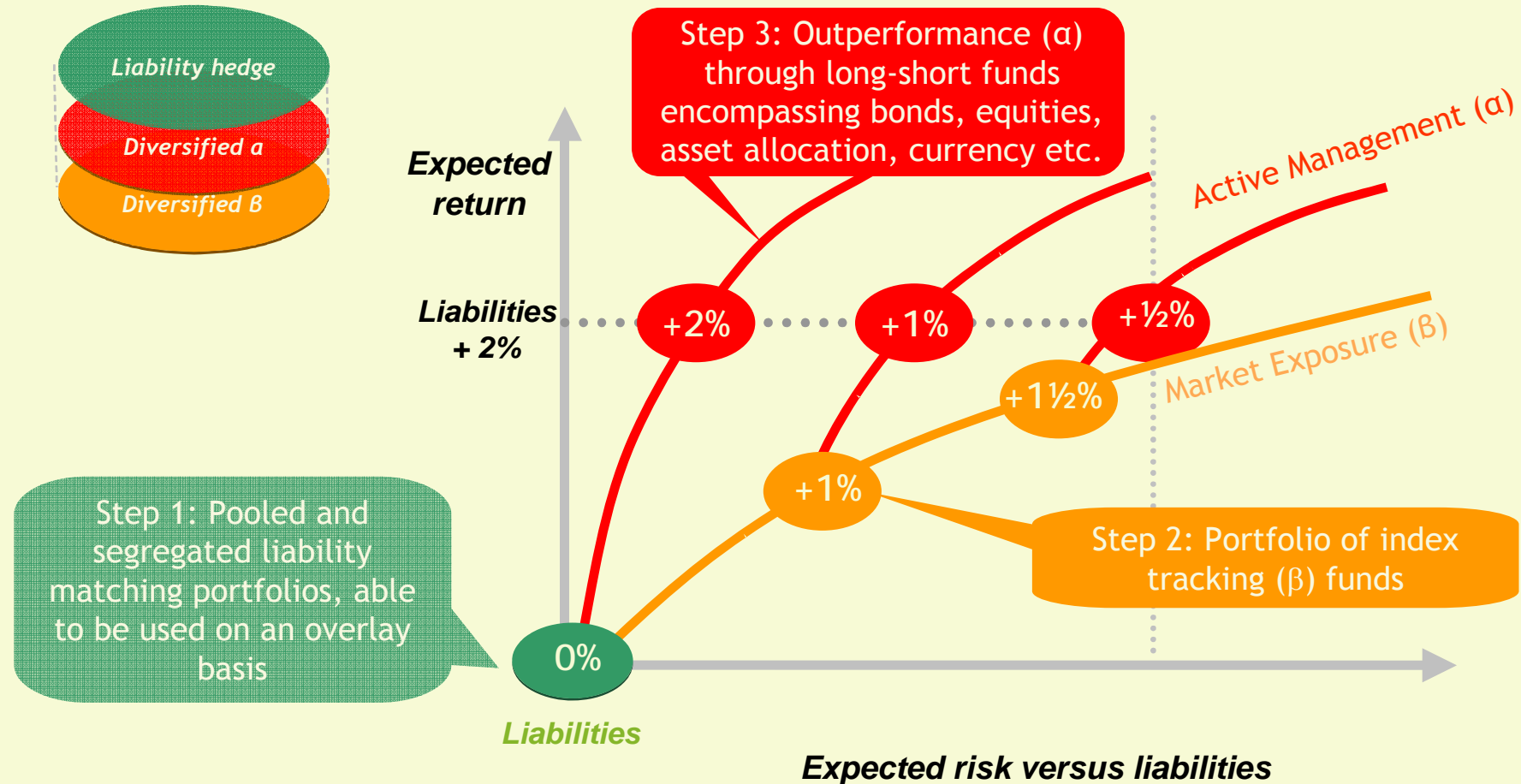
- Taking more risk does not lead to higher returns for long only portfolios
 - Negative views cannot be fully reflected without shorting
 - Only a small number of stocks in the All-Share index have a weight of more than 1%



Low risk strategy has a better information ratio

Investment efficiency in a liability context

Solutions involve a varying split between alpha and beta sources to suit client's preferences



Building block implementations

A full spectrum of solutions within Fixed Income

Govt bond funds + Swap based funds = Duration extension over government bonds

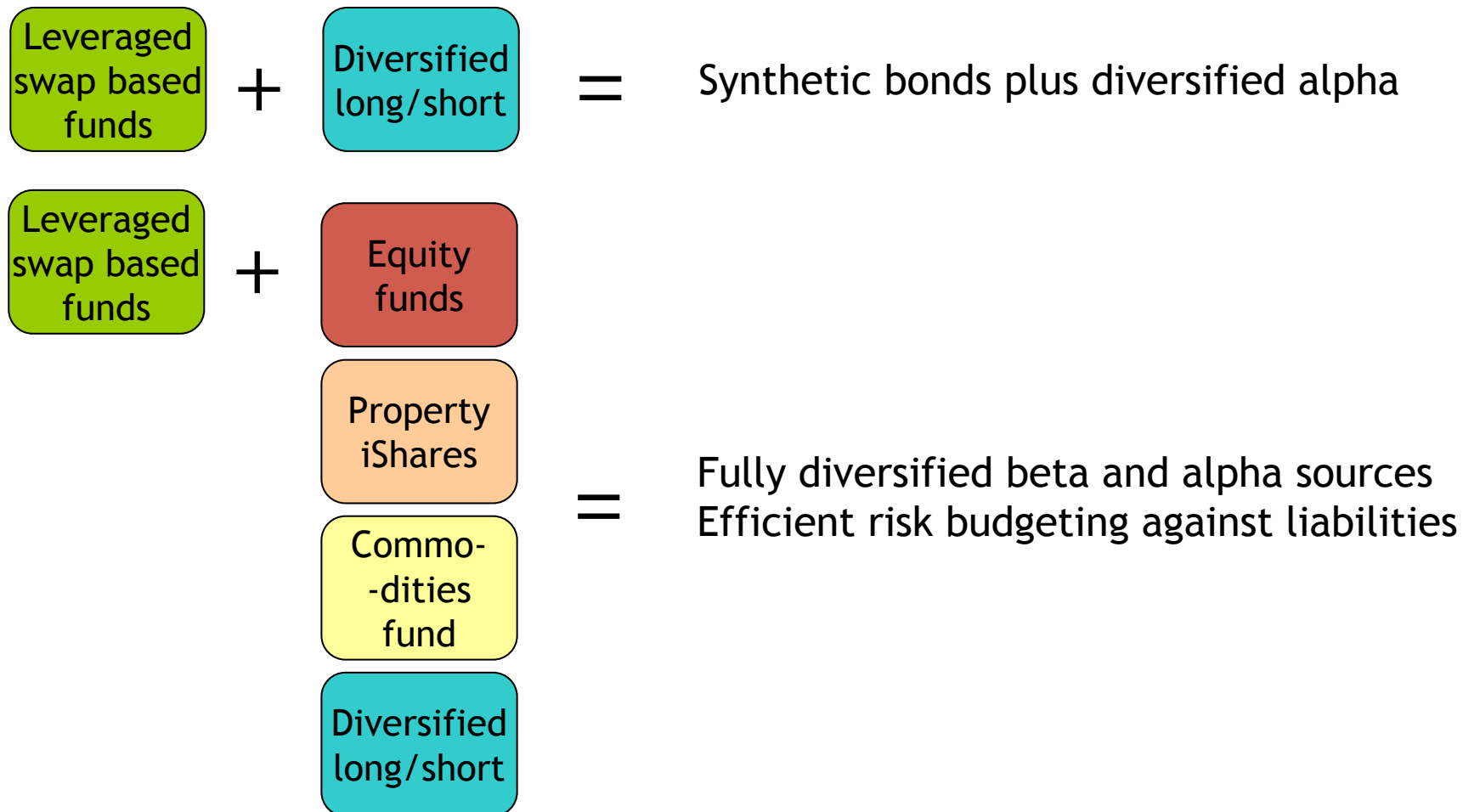
Swap based funds = Replicating liabilities fully with zero-coupon swaps

Swap based funds + Diversified Credit fund = Replicating liabilities with credit spread

Swap based funds + Diversified Credit fund + Fixed income alpha funds = Actively managed long duration

Building blocks for other asset classes

Leveraged swap based funds in combination with non-fixed income assets



Block builder's manual

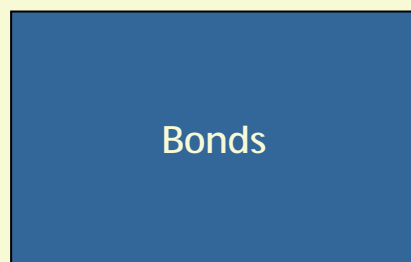
In the absence of portable alpha & beta

- Manager allocation problem can be handled in same way as asset allocation
- Need to determine, for each manager:
 - Style biases (factor exposures)
 - may not equal benchmark
 - Expected residual active risk & return
- Optimise
 - Aversion to active risk needs to be higher than aversion to market risk

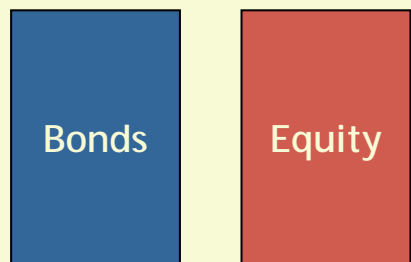
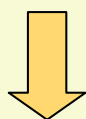
Swaps enable risk control and explicit risk-taking

Separately manage liability risk management and return generation

Without swaps

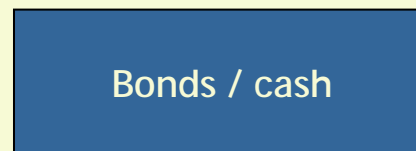
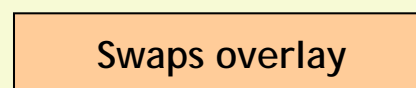


Difficult to hedge interest rate and inflation risks

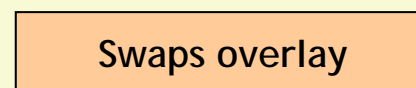


Additional interest rate and inflation risks

With swaps



Interest rate and inflation risks can be hedged

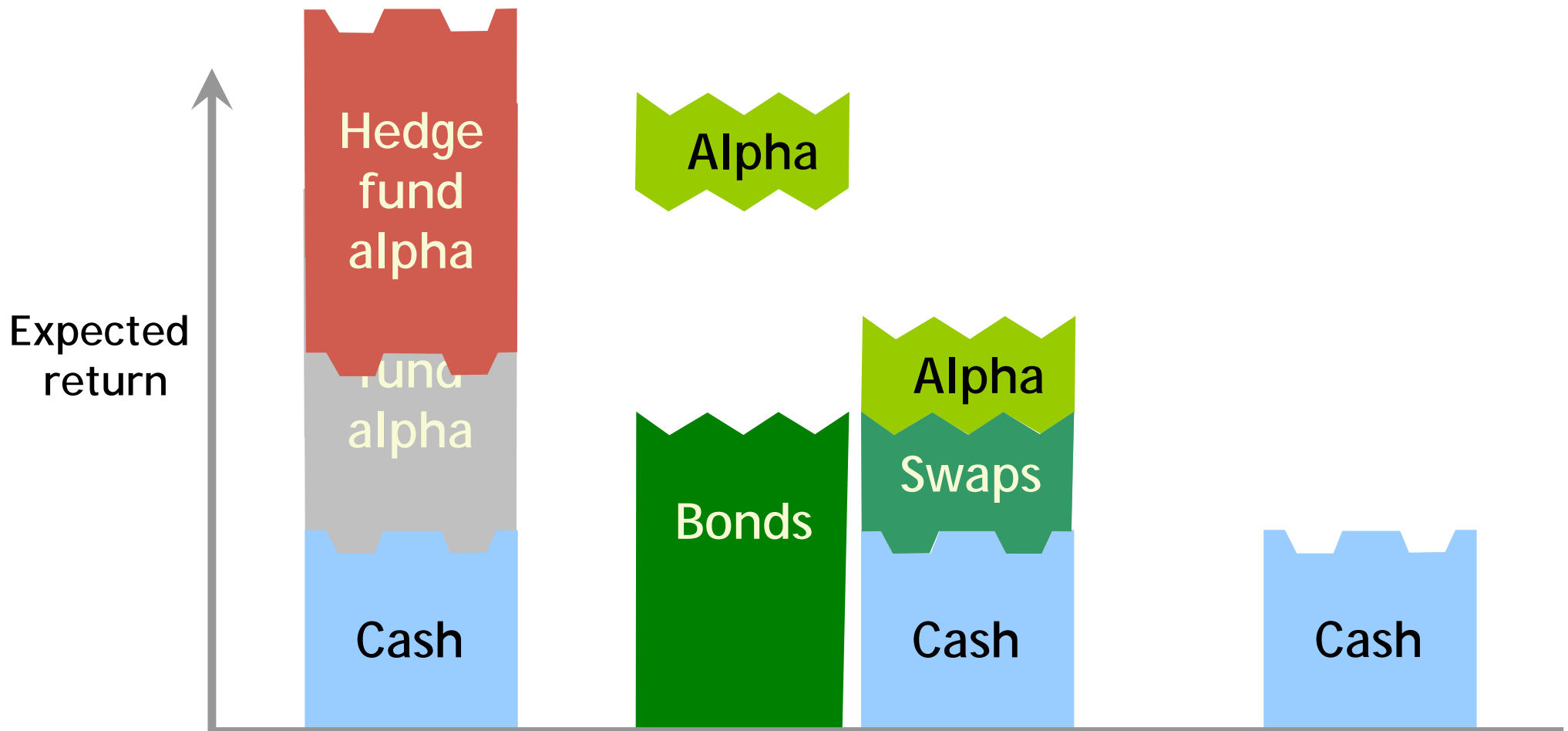


Interest rate and inflation risks still hedged

Same expected return, but less risk

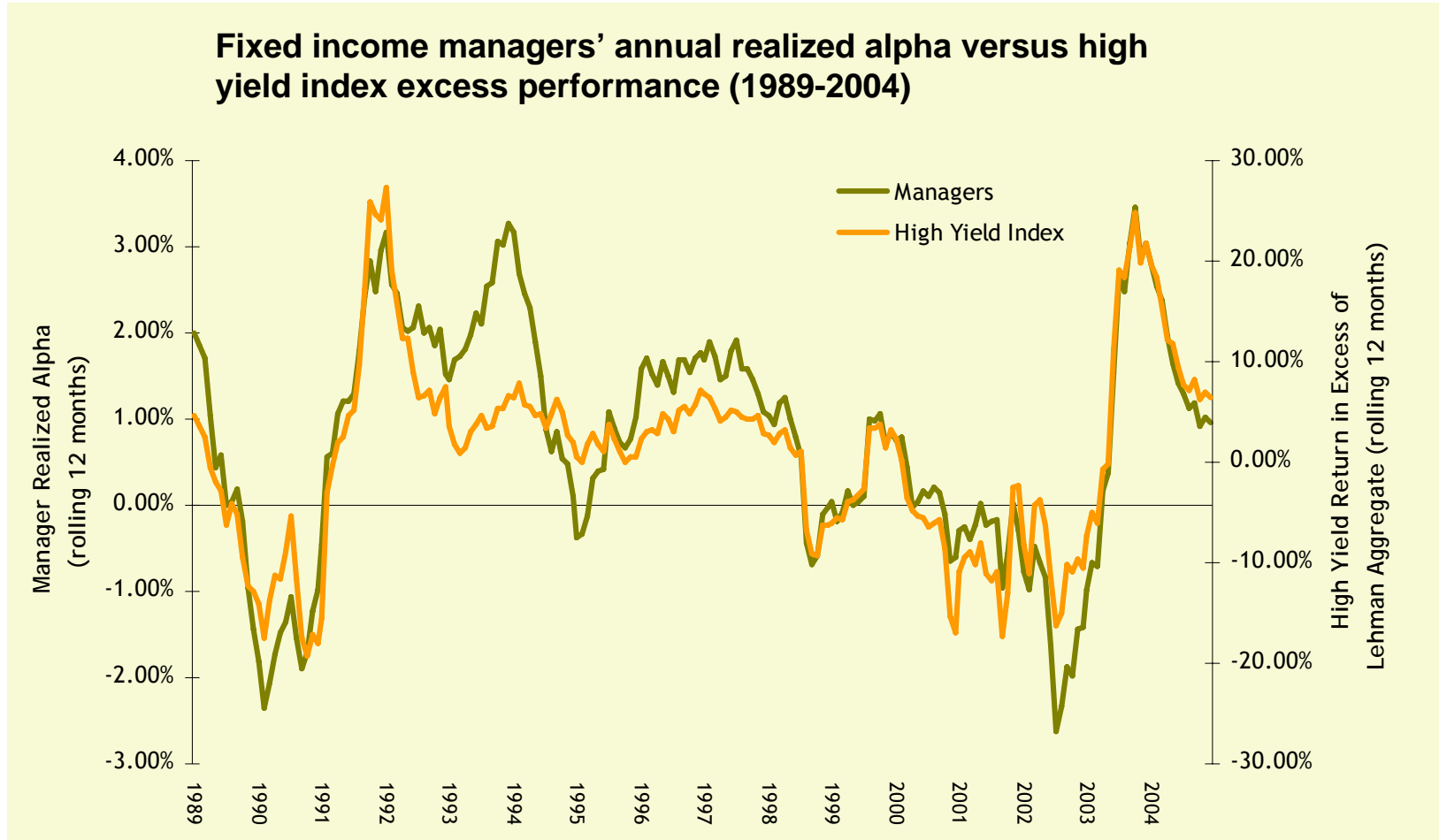
Portable alpha

E.g. transfer alpha from cash benchmark to a bond benchmark



Beware beta masquerading as alpha

Active bond returns: high correlation with 'tilt' into high yield bonds

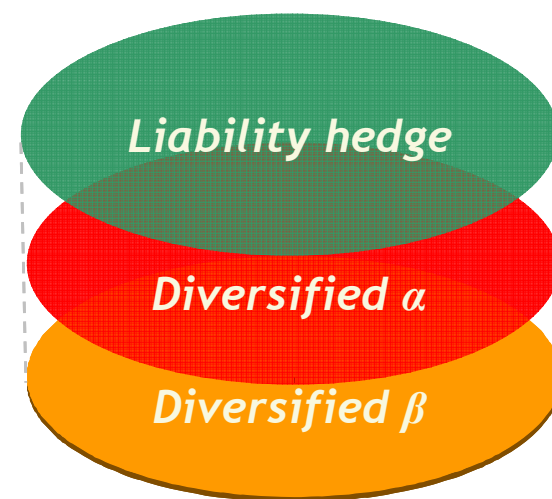


Source: CorePlus Manager Universe, eVestment Alliance.

Summary

Derivatives enable alpha & beta to be separated

- Minimise risk relative to liabilities
 - Match inflation and interest rate sensitivity of the liabilities using appropriate swaps
- Add value through taking investment risk in a targeted and structured manner
 - Use broad range of asset classes (diversified beta)
 - And broad, unconstrained active investment insights (diversified alpha)
 - If you like a manager's alpha but not his beta, then remove the beta - portable alpha



Focus on risk, return and cost relative to liabilities