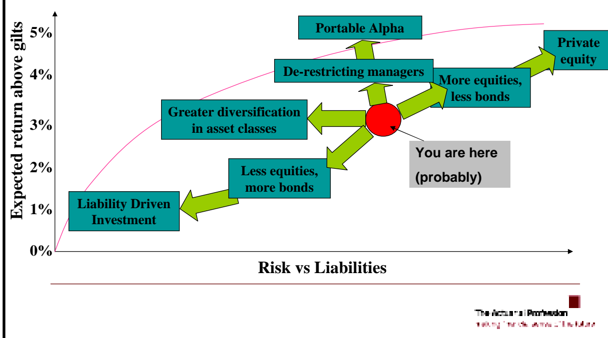
The Actuarial Profession
making financial sense of the future

From LDI to Hedge Funds

Where to place your bets in the new Investment world

David Hargreaves
Annual Pensions Convention 2006

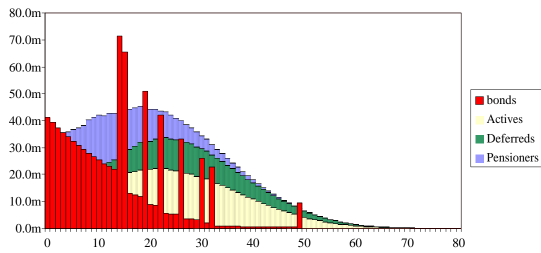
All comes Down to Investment Efficiency



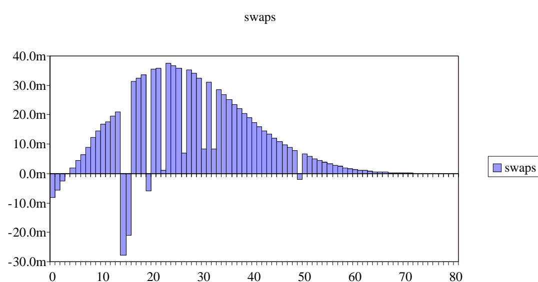
Starting with the Lowest Risk Position

- We start at the lowest risk investment strategy
- Then we will see how we can take more risk to get more performance in the most efficient way
- At each stage we look at the evidence we need to evaluate whether each decision we take is rational or just hopeful

Lowest Risk is about matching cashflows

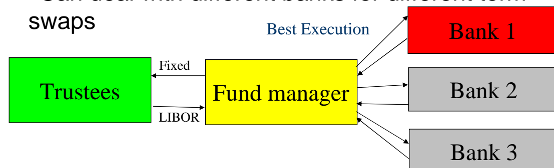


Need to Use Swaps to fill in the gaps



Using a Fund Manager

- Good managers have daily pricing screens from the major swaps providers
- Can be sure they are able to deal at quoted price
- Can deal with different banks for different term swaps



Pros and Cons

- Lowest risk
- Can include mortality as well – but expensive
- Can be done even for underfunded scheme

- Expensive
- Need to involve fund manager to ensure best execution
- Still leaves mortality and other demographics usually

Why would we ever do anything else

We might be able to make the pension scheme cheaper to pay for?

- Some investors believe they can gain an advantage over other investors by having superior skill (α)
- Investors can receive a premium for taking risks off other investors (β)
- Gilts and swaps are very liquid – which is a white elephant premium for a pension fund

β – the simplest pension scheme bet

- This is the additional reward investors expect to receive for taking risks off other peoples' hands
- For example: Companies issue equities rather than bonds because they wish to share their enterprise risk rather than gear it up
- Both parties in this transaction are probably behaving rationally – ***they just have different risk budgets***

But its not just about equity

Foreign Bonds
•Would need currency backed out

Property
•The classic equity substitute

Commodities
Markets which are typically in ***backwardation*** offer a risk premium to investors

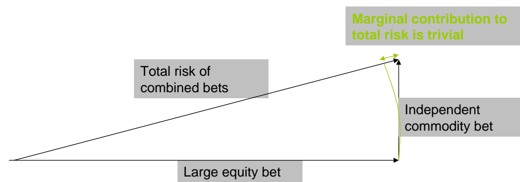
PFI
Lack of capacity but
Bond like characteristics
With return premium

Corporate Bonds
Historic default vs. credit spreads suggest this is a rewarded risk

- Finding every source of beta we can is equivalent to investment in the full market portfolio in CAPM

Independent Sources of β

Independent sources of β provide the classic free lunch of diversification



But how do we get there

O/S equity	Cheaper – no stamp
Corporate bonds	Market size is growing
Emerging market debt	b/o spreads larger – active management more useful
property	7% turn around costs typically
PFI	Lack of market size a restriction

How much to have of each

- Optimizers are hyper sensitive to spurious assumptions
- Common to take a pragmatic approach
- Typical limits might be
  - 15% property
  - 5% private equity

α – the next traditional 'bet'

- Whereas β will exist if there are other rational players with lower risk budgets
- α will only exist if there are less skillful or less well informed or less rational players in the market ***and***
- There are enough of them to materially impact the market price
- It is a World of red herrings and mirages but one where trustees are duty bound to tread

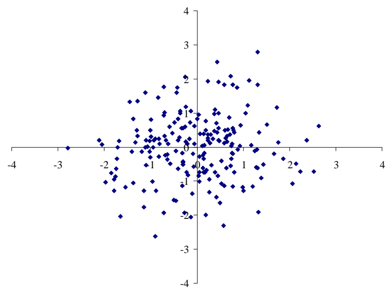
Does α exist

- There are professional poker players
- There are ***no*** professional roulette players

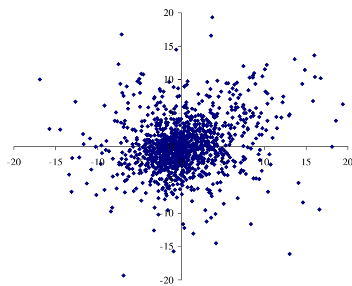
Are we playing poker or roulette

- There are no good roulette players
- There ***are*** good poker players
- We know this because some people can make a consistent living out of poker
- **Conclusion**
- A test statistic for market efficiency is ***serial correlation*** of manager performance

Completely Random



UK equity pooled funds



Performance of UK equity funds relative to median manager is consecutive years since 1988.

56% of managers who outperformed in year x then outperformed in year x+1

How much α can we get

- Above average UK equity managers in year *t* have a 56% chance of being above average in year *t*+1
- If we pick the managers with the best performance last year then we get an information ratio of 12%
- If we pick the most skilful active managers (but not necessarily the luckiest) we can expect an information ration of 34%.
- However this involves having the conviction to pick active managers many times with poor track records who have just been unlucky.

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'But we're doing it for the economy'

- Grossman Stiglitz contradiction is an ***equilibrium*** not a contradiction
- Capital allocation occurs when fund managers buy equities from the investee companies not from each other
- Ultimately each market should exist at the edge of efficiency where the average active manager makes enough at the expense of the average passive manager to justify the additional costs
- It's not the trustees job to ensure that there is liquidity in the capital markets

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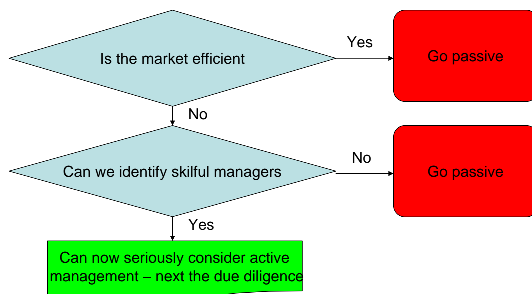
The Path to α



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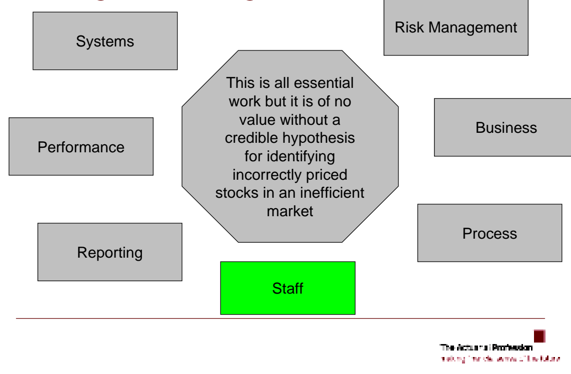
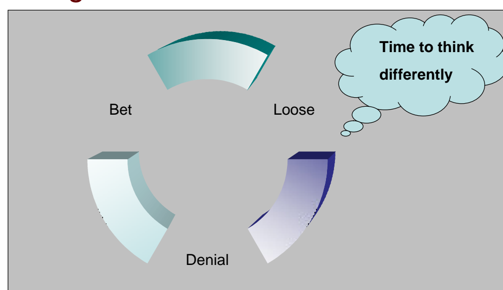
Manager due diligence



Actuarial control cycle for fund managers



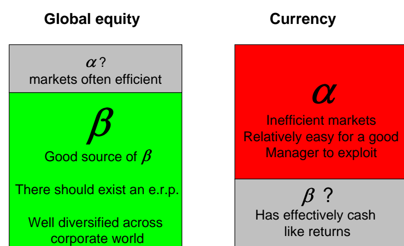
α vs. β – getting the balance right

- Where α exists it generally has a better risk return trade off than β.
- It makes sense to take as large bets as possible where the conditions for α exist.
- Marginal contribution to total risk is small

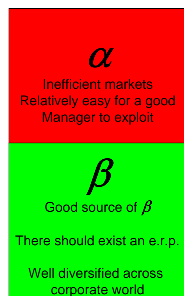
Getting the most out of α

- What can actually be done to get the most out of α.
- Unconstrained / high performance managers
- Long short hedge funds
- Derestricting mandates
- Don't chase it where it doesn't exist
- Do look outside the traditional box for it
- Port it

What if my α and β are in different places



Portable α (or β)



- Traditional to think in terms of portable α
- Could equally invest the α and port the β
- Comes down to which minimises derivative costs
- More likely to keep sources of β for the long term so generally sensible to be physically invested there

After α and β comes…

- Is the pursuit of α and β the only reason for a pension scheme to mismatch?
- No
- Pension scheme are long term investors
- They do not need liquidity (for the most part)
- Other investors do and will pay a premium
- It makes sense for other investors to pick up the ***illiquidity premium***

Illiquidity Premia

Property
- Diversifies away from equities as a non-matching return orientated asset class
- Has part equity like and part bond like properties
- Difficult to trade in small chunks unless via pooled fund route
- Illiquid – approx. 7% turnaround costs

Private equity
- Very illiquid – can take ten years before any return comes through
- Manager selection very important
- Returns can be very strong but also volatile
- and highly correlated to traditional equities

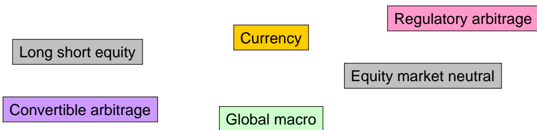
PFI
- Government backed (?) bond like cashflow stream
- Potentially very string risk adjusted returns
- Access difficult (£50m is a large mandate)
- Risks exist around changes in government policy – political pressures etc

Non government and high yield debt
- Credit spreads on corporate / emerging market / high yield debt are higher than historical default rates would suggest
- Financial economics would suggest that this is not a reward for specific risk
- So probably a liquidity premium

What about Hedge Funds

- They're in the title so we had better talk about them
- Don't get hung up with hedge funds for hedge funds sake
- Its not an asset class – its just an arbitrary grouping of managers
- The same rules about market efficiency and manager skill apply to hedge funds that apply to anything else

What different sorts are there



All characterized by very light regulatory touch

Ability to move in and out of markets very quickly

Ability to hedge bets to remove spurious risks and just extract α

Fees can be very high say 1.5% base + 20% of outperformance

And then possibly manager of manager overlay (1% + 10% outperformance) - Total fees around ***6-7%***

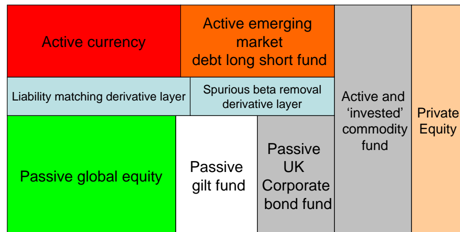
Where might hedge funds come in (1)

- You have a skilful emerging market equity fund manager
- He has added value by holding 5% in BananaCo and 0% in MangoCo.
- It follows that had he held 10% in BananaCo. And -5% in MangoCo he would have added more value
- **SO** – A long short equity hedge fund is just a way of getting more return from the equity manager's skill.
- The fact we call this a hedge fund has got nothing to do with it

Where might hedge funds come in (2)

- Most bond and equity managers are restricted to trade within their defined asset class
- If the convertible bonds of a company look cheap then they can't take advantage so mispricings may persist
- Hedge funds can take advantage
- **BUT** – opportunity will erode as hedge funds move in
- **QUESTION**: do consultants / FoFs have the skill to know when to call off the bet

What might a total structure look like



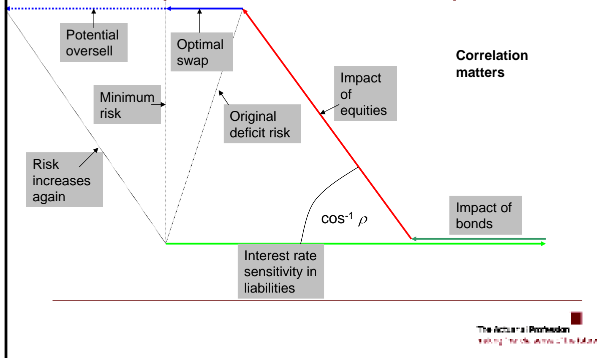
What does Derivative Layer do
1) spurious β removal

- Glue that allows us to add α to β.
- Without it we would have unrewarded risks such as overseas currency and cash like investments
- Typically sell some of the β asset then take out a forward derivative position which is long the β asset and short in the α asset so the overall β is the same

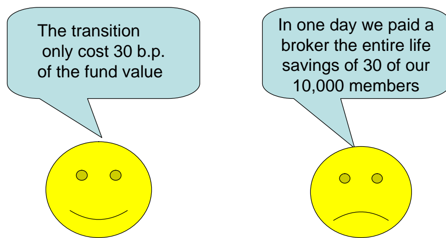
What does Derivative Layer do
2) Liability matching derivative layer

- This is more complicated
- The liabilities inter-act with each of the asset classes in place
- In simple terms if the equities are correlated positively to bonds then this reduces the interest rate sensitivity in the asset liability position and the amount of liabilities that need to be swapped out is reduced

How to think about the optimal swap when equities and bonds are present



Investment costs – the forgotten issue



Investment costs are very large amounts – don't be fooled by the apparent small percentage of assets under management

Investment Costs are everywhere

Transitions

There are a number of things you can do:
- Ensure as much as possible is done in-specie
- Use a transition manager to ensure crossing
- Don't trade on days of thin market activity
- Make flexibility over transitions part of manager ratings
- Don't keep churning managers by chasing past performance

Fund manager Fees
- Fees are not charged on contributions or on benefits but on the whole fund value every year
- They can be negotiated down
- Take particular care with performance related fees

Consultant fees
- At least visible and explicit
- Beware of unnecessary over complication
- Beware of £10k of strategy which costs £60k to implement

Broker Costs
- Large amounts of money
- 30-40bp per equity trade
- Hidden in performance
- Trustees should expect disclosure
- Softing etc

Custody fees
- Custody costs are coming down
- The industry is consolidating
- You can save your client a lot of money by conducting a custody review

Beware performance related fees

Consider the following fee structure:

- 20bp per annum on the fund amount
- + 10% of the outperformance of the benchmark

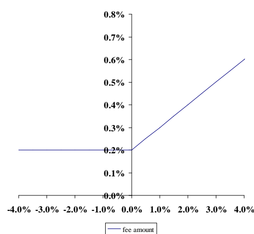
This clearly incentivises the manager to perform as he will get paid more if he does

But what else does it do

The embedded option has value

- Payoff profile is as shown
- This is an option
- It has a value
- So value of fee has three parts:

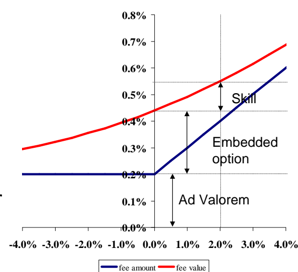
1. Fixed fee part
2. Embedded option
3. Reward for skill



We can plot the fee ***value*** as a function of the manager ***skill***

- Assume manager has
- Tracking error = *6%*
- Known skill plotted x axis
- i.e. perf ~ N(x *%, 36 %%*)

- The red line shows the total value to the manager of the given fee structure



Activism

- Activism is ‘real fund management’
  - engaging management
  - Voting at AGM’s
  - Potentially selling shares
- Stock options, exec bonuses and golden handshakes are costs to pension schemes
- Trustees should seek to control these costs and ensure they represent value to scheme members

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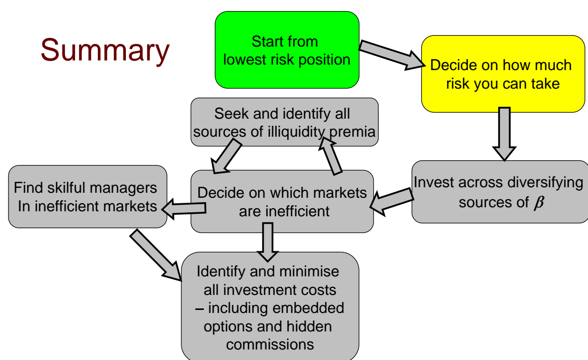
Summary



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