TOWERS PERRIN

When theory and practice are not always the same

Earning Libor on cash is easy – isn't it?

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Agenda

- Case study - pension fund de-risking
- The challenge to generate a Libor return without undue risk
- Re-visiting the case study with some different modelling
- Implications and discussion points

The views presented here are presented for the purpose of the sessions in the authors personal capacities. Any views or opinions are not necessarily those of their employing firms.

Context

- Very mature scheme - 22% deferreds and 78% pensioners
- Sponsor's business sold over 10 years ago
- Pension plan retained
- No pension accrual
- Sponsoring employer dormant
- Run off responsibility accepted by sponsor
- Desire to achieve run off without further cash
- Majority of pensions 'covered' by a bulk annuity policy
- Sponsorship taken on by Bank

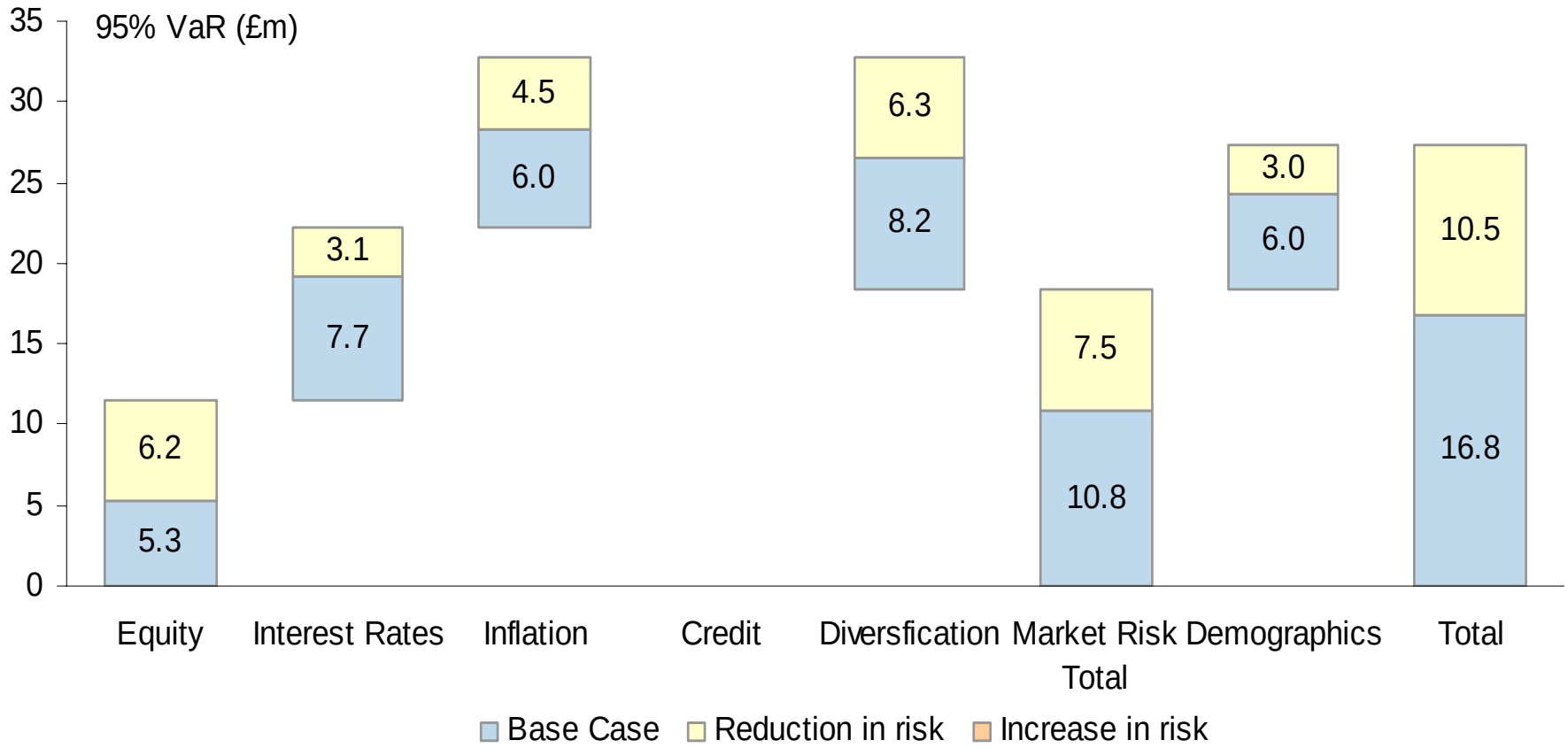
Trustee and Sponsors interests aligned - to minimise

Risk Management Progression

- Asset allocation 25% equities and 75% long dated bonds
- Bulk annuity policy acquired
- Early 2007 – equities sold
- Early 2008 – swaps executed and cash invested to generate LIBOR

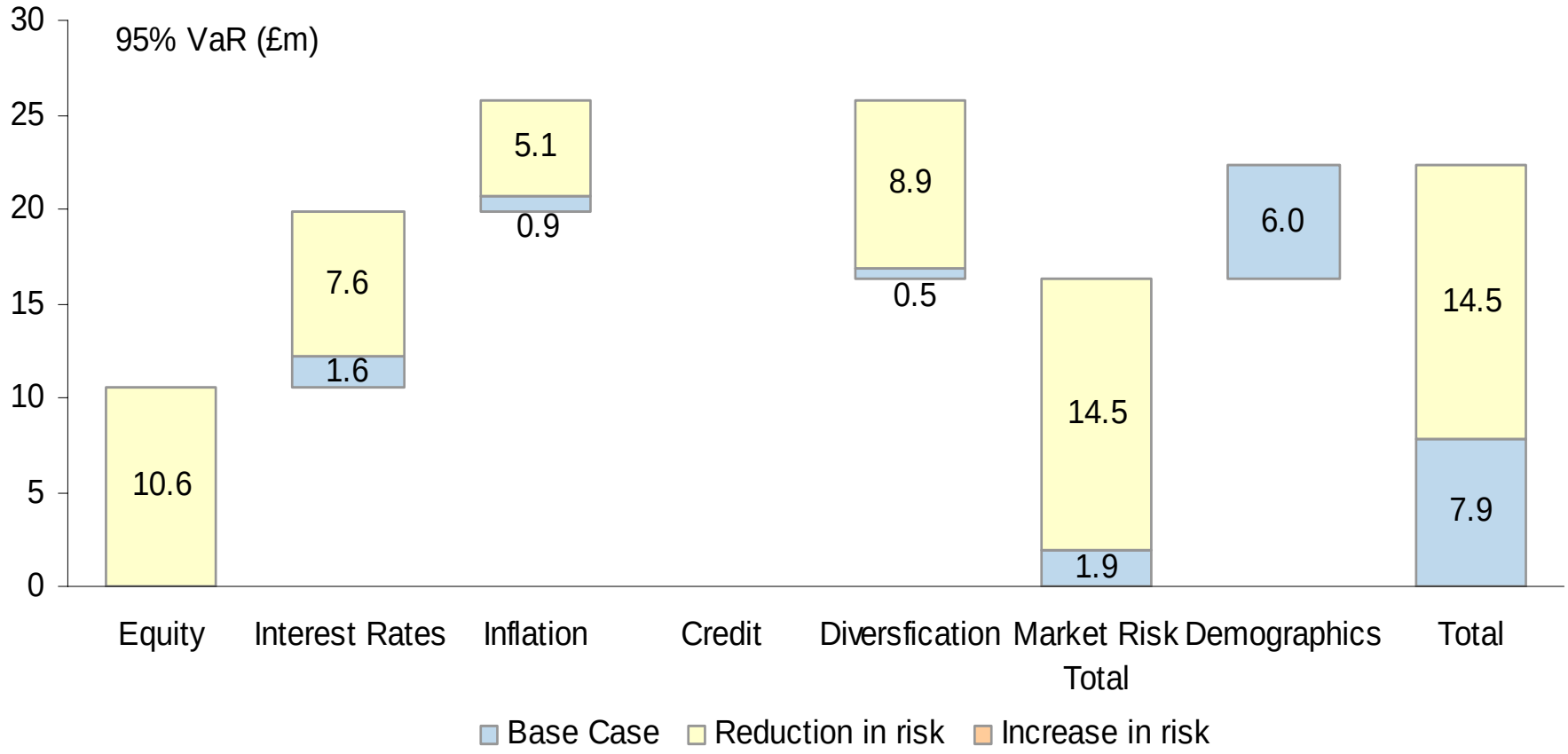
Challenge is to generate LIBOR with minimum

Impact of De-risking – Annuity Purchase



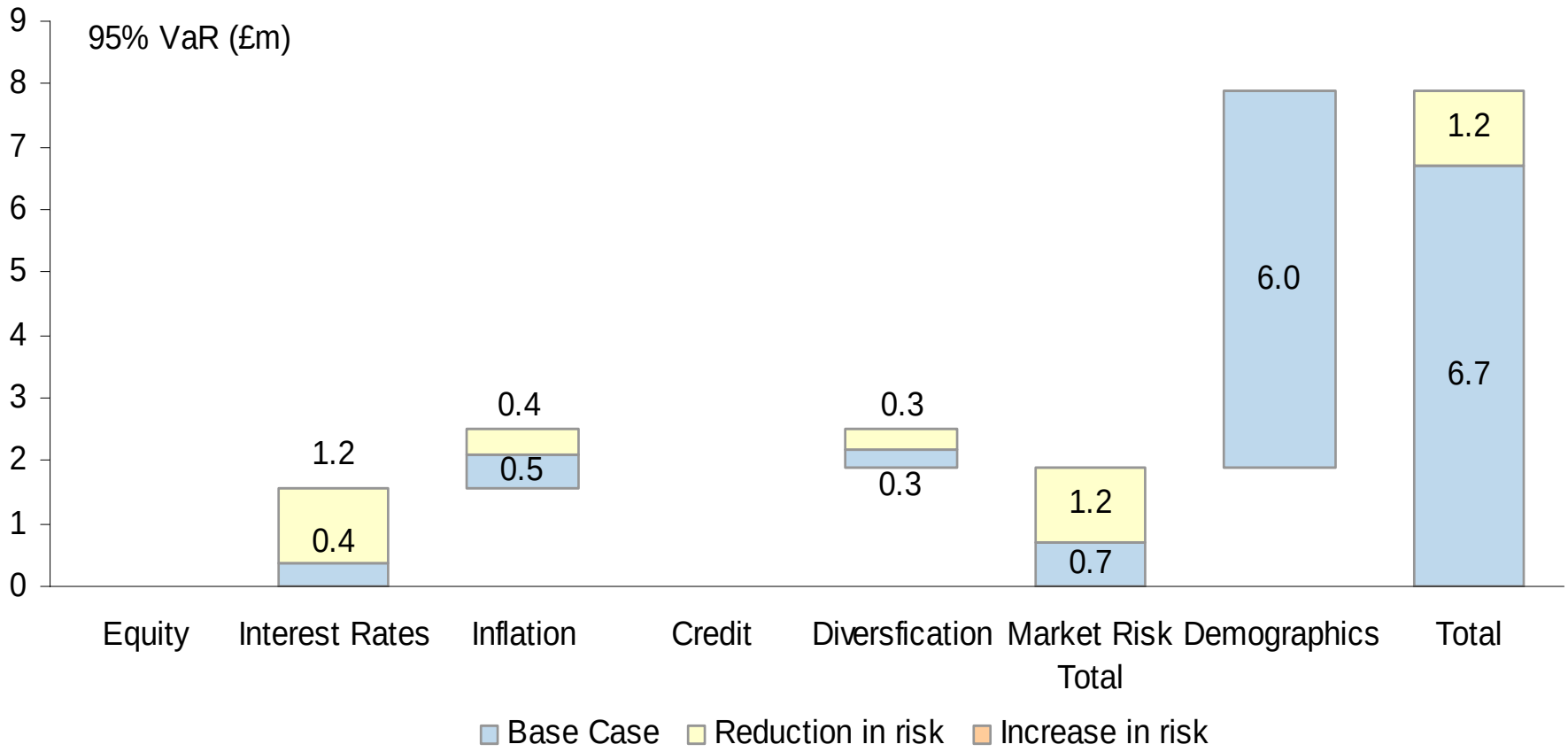
- Bulk annuity covering majority of pensioners reduces all risks
- Pensioners generally shorter duration exposure so reduction in interest rate, inflation and demographic risks more limited

Impact of De-risking – Equity Sale



- The sale of equity eliminates that risk and the reinvestment into long dated index linked gilts substantially reduces the interest rate and inflation risks
- Net benefit of transaction is offset by loss of substantially all of the diversification benefit

Impact of De-risking – Swaps

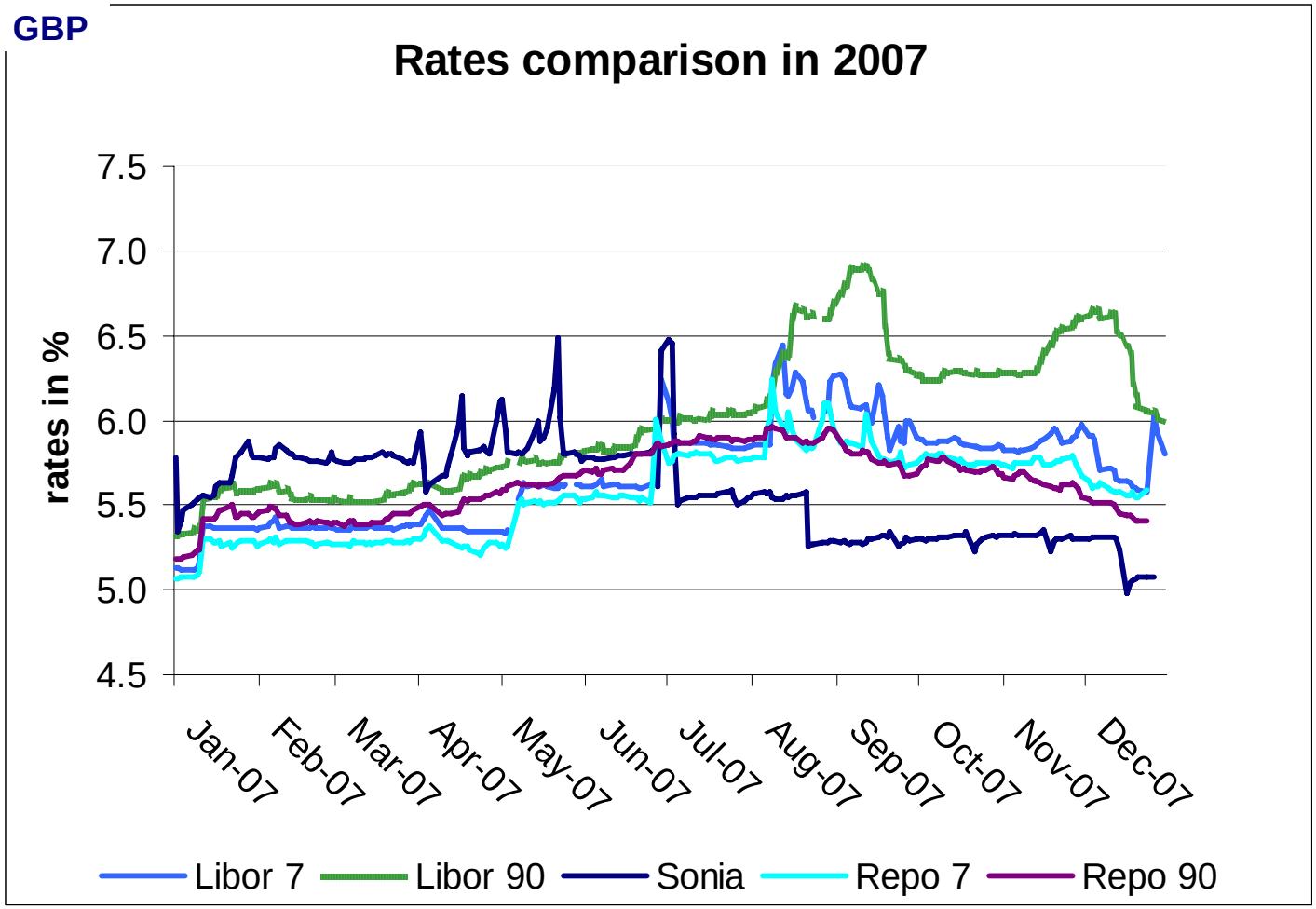


- The swap implementation refines the mitigation of the interest rate and inflation risks

Some background on the rates

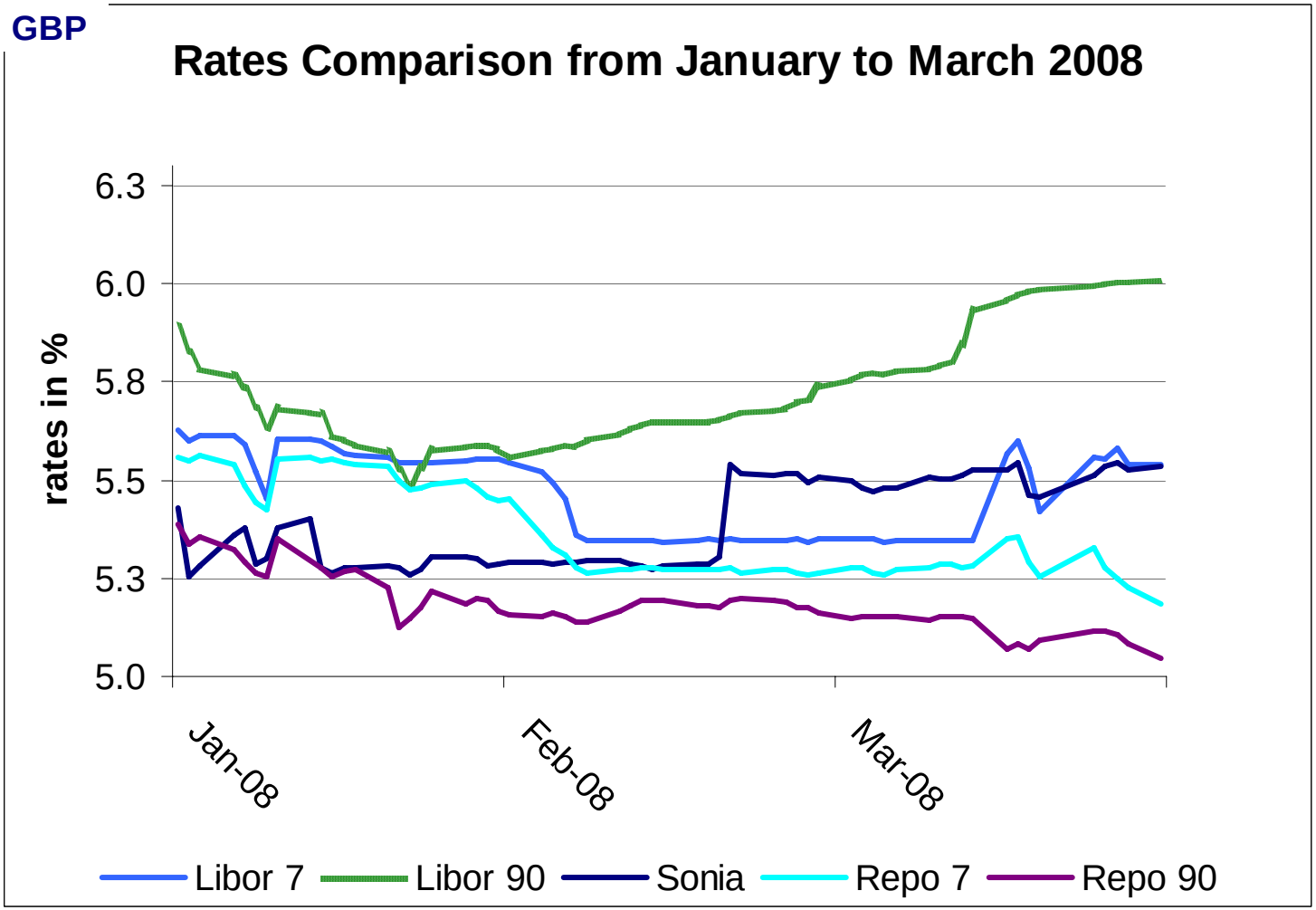
- Libor – London Inter Bank offer rate – rate to lend
- Libid - London Inter bank bid rate – rate to borrow
- Sonia – Sterling Overnight Index Average
- Repo – effectively the lending of money against gilts as collateral but structured as a sale and forward repurchase agreement
- Great background sources:
  - BBA - British bankers Association
  - WMBA - wholesale markets brokers association
  - BOE - Bank of England
  - DMO – Debt Management office

In the middle of 2007 things changed abruptly



Sources: www.bba.org.uk, www.wmba.org.uk

Significant spread volatility continued



Sources: www.bba.org.uk, www.wmba.org.uk

Earning Libor without risk is not possible due to fee levels

- If we are very efficient we might get something like
  - The gross rate required – Libor
  - Spread bid to offer – 10bp
  - Investment management fees – 5bp
  - Custodian fees – 2 bp
  - Frictional costs of collateral posted – 2bp
  - Swap contracts spread - 4bp
- So before we allow for any credit risks we are most likely at least 25bp below earning Libor
- Over 20 years this would mean we needed to start with close to 5% extra cash to meet our 20 year commitment
- Many packaged “LDI” bundles are considerably more expensive

Rapid changes in the price of credit and liquidity risk provide opportunities for long term cash investors

- Deposits
  - Major UK banks
  - Major foreign banks
  - Other banks with high credit rating
  - UK building societies
- Floating rate notes – bank and building society backed
- Asset backed securities (AAA)
  - UK mortgage backed
  - Corporate assets
  - Bank guaranteed
  - Credit enhanced - over-collateralised versus insured

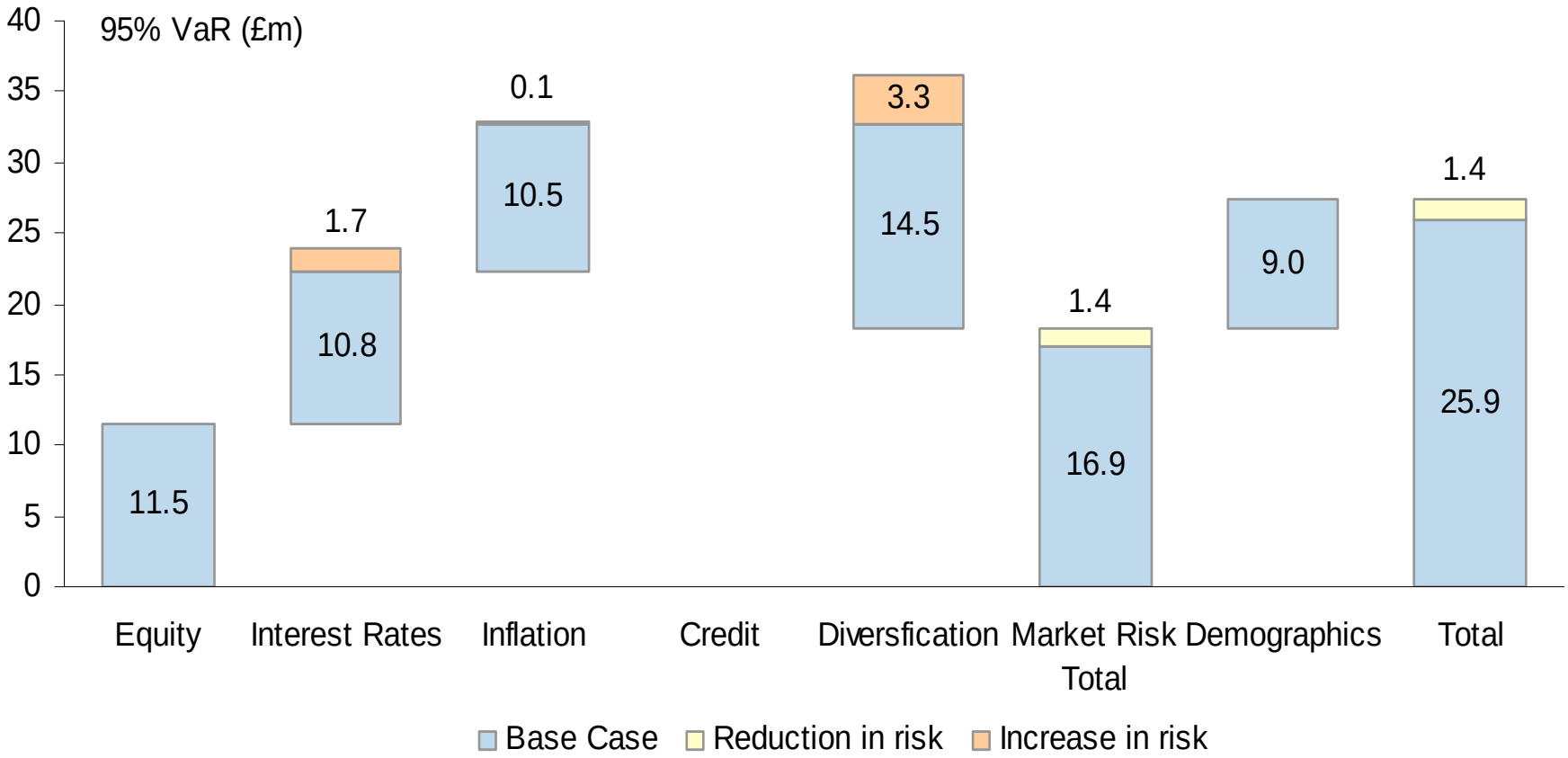
Indicative returns over total holding period reflect credit and liquidity risk profile

Approach	Underlying security	Indicative return (net of fees)
Gilts fund	Absolute	Libor – 50bp
Cash fund - short term bank and building society deposits	Extremely high	Libor – 10bp
Money market fund – longer term bank and “high quality” asset backed financial company borrowing	Extremely high	Libor
Corporate bond fund (AA)	Very high	Libor +30bp

Modelling Gilts and Swap Spreads

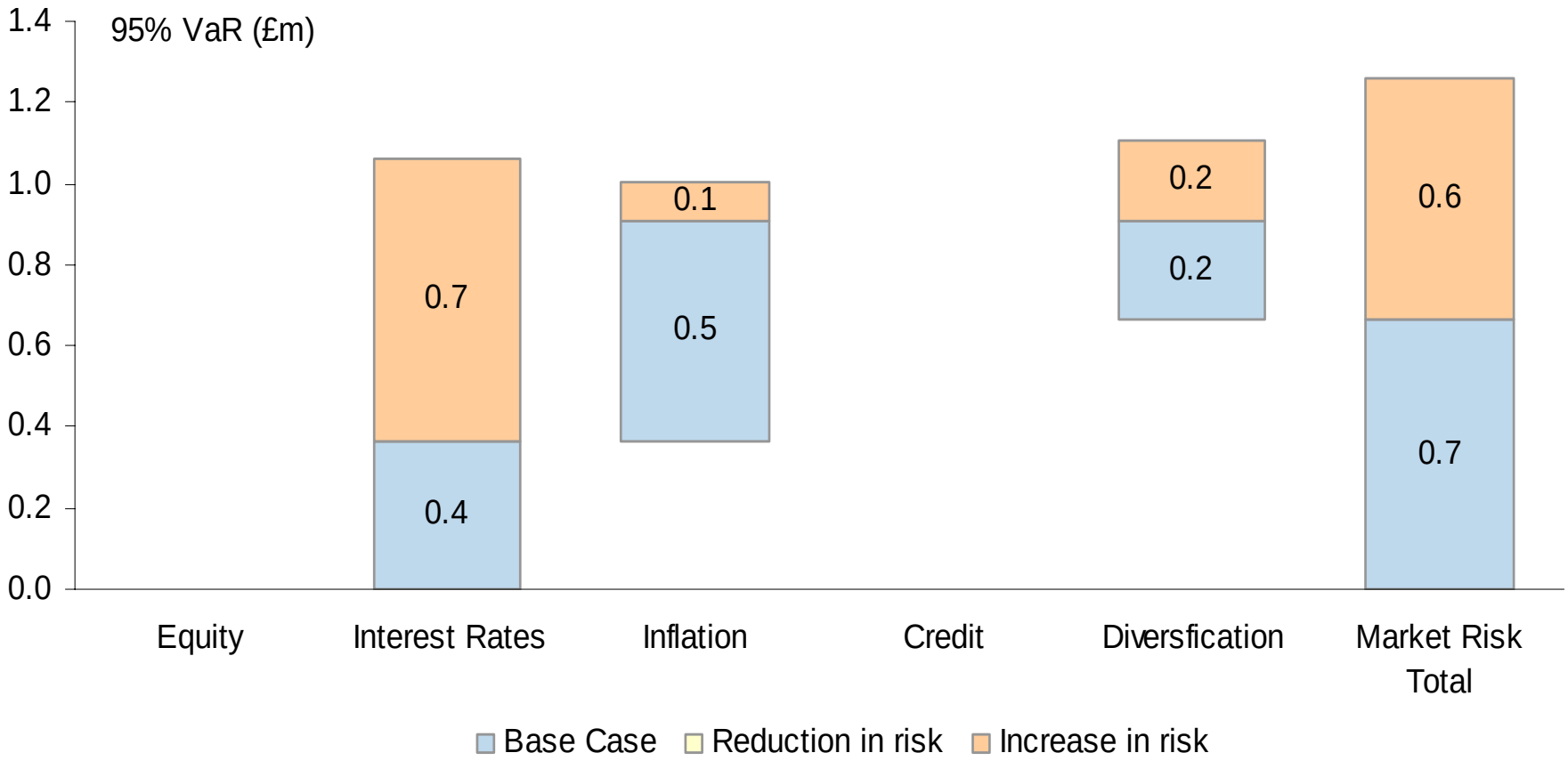
- Original Model
  - simulated interest rate swap and break even inflation curves
- Updated Model
  - simulates Gilt curves, and
  - Swap spreads
- Swap spreads
  - Historic times series – highly volatile but range bound
  - Modelled with high mean reversion
  - Limited correlation with other variables
- New model swap curve **MORE VOLATILE**

Impact on Risks – Pre Risk Management Actions



- The new model increases the interest rate and inflation risks marginally but this increase is offset by an improvement in the diversification
- The net impact is again marginal but positive

Impact on De-Risking – Cash Fund



- By representing the performance of the fund independently of LIBOR we can see a very significant increase in the residual risks
- The net effect is again mitigated by some diversification gain

Impact of De-risking – LIBOR Fund

- The use of more credit exposure introduces greater undiversified risks, but overall is positive as a result of increased diversification
- The picture is reversed from that before de-risking

Conclusions

- Generating LIBOR is **not**
  - risk free or
  - a commodity product
- Selecting a LIBOR manager is as important as your swap provider
- Ensure the asset manager has an excellent credit analytics process
- Risk budgeting needs to be developed to fully reflect **all** the risks
- Understand whether you want to take a liquidity or a credit risk
  - Financial or corporate sector credit risk
  - ABS or not?
  - Diversify sources
- Retain some interest and inflation risks (?) as it allows
  - exposure to credit risk
  - higher overall return for the same risk as a result of diversification

Industry Implications

- Scheme has a profile that is perhaps ten years ahead of most other schemes
- Current de-risking strategies that use swaps to allow investment into equities will ultimately need to unwind either:
  - as scheme matures or
  - if the growth assets deliver their expected returns and eliminate deficits
- 'De-leveraging' accelerating as a result of buyouts
- Insurance company issues similar to Banks ie risk based capital
- As the LIBOR market grows who will supply the product
  - Asset managers
    - Bundled with swap execution as LDI
    - As a fixed income credit product
  - Broker Dealers – who already manage £bns for non-fiduciary clients
- Investment Consultants need to develop manager selection in this area

Implications for actuaries

- Look across the whole time period and the changes that will occur in asset allocation
- Be aware that the ranking of risks and their relative importance in modelling changes as LDI structures mature - Trustees may get anchored by what used to be most important
- The actuary needs to form a view on what is a “net” risk free return for modelling purposes:
  - Lower boundaries are Repo rates, Gilts or Treasury Bills
  - Higher boundaries are somewhere below LIBOR
- While these boundaries were assumed to stay close this issue did not seem so important in the overall scheme of things. The gap does not stay constant
- Don’t fall into the endowment trap – be aware of red, amber and green! so funding implications are clear.