The Actuarial Profession
making financial sense of the future

Risk-Free Rates of Return

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16:00 – 16:50
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Current Issues In Pensions Seminars

Risk Free rates pervade Actuarial Work

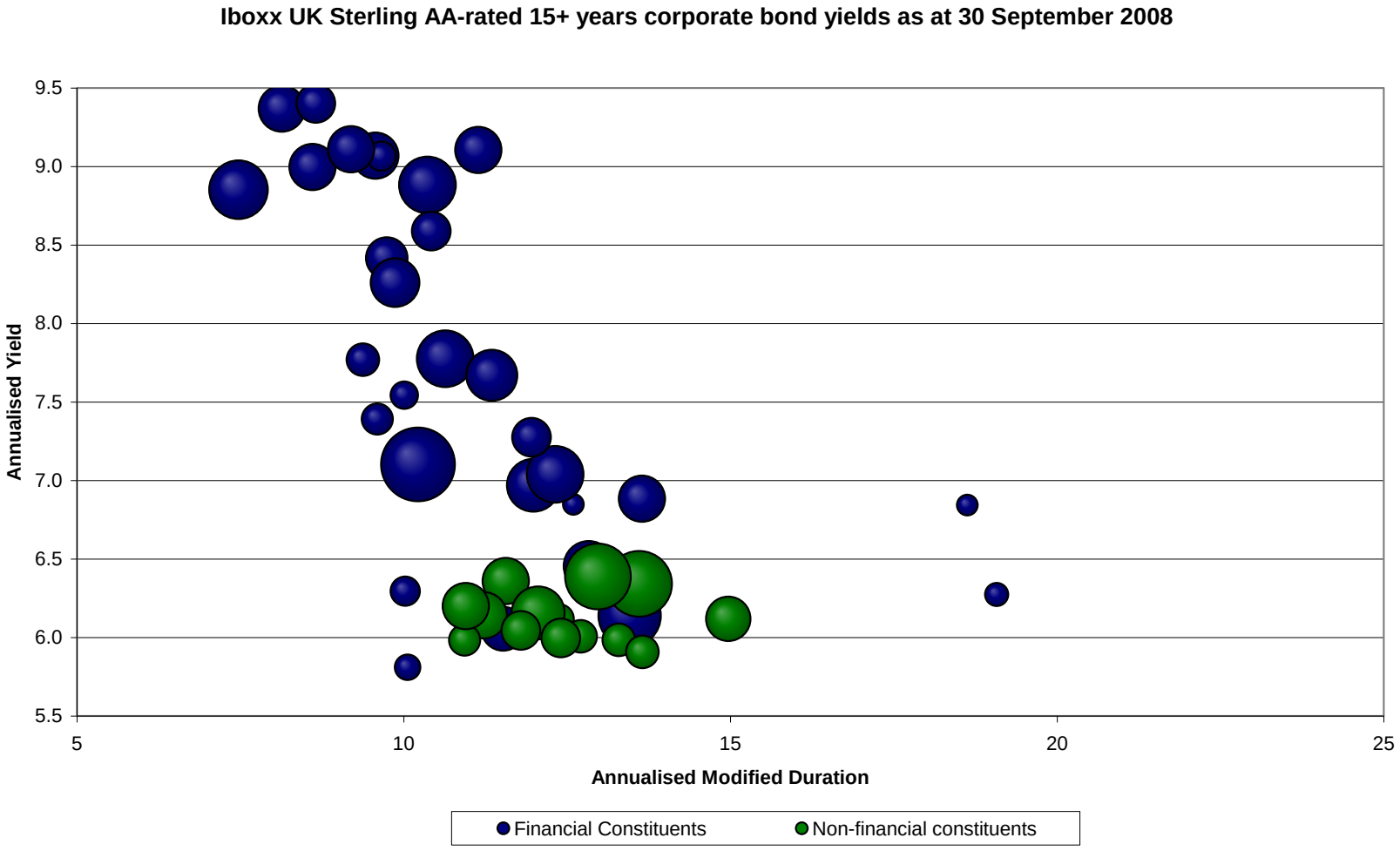
- Controversial ASB/EFRAG discussion paper on pensions accounting
- CEIOPS references to “risk free rate” for discounting under Solvency II
- CFO forum “risk free” rates for market consistent embedded value
- IASB discussion paper on insurance accounting
- FSA insurance sector briefing discusses role of liquidity premium for valuing annuity liabilities
- Extensive treatment in IAA RMWG paper (www.actuaries.org/CTTEES_RISKMARGIN/Documents/RMWG_Exposure_Draft2.pdf)
- Developments in markets:
  - Widening corporate bond spreads
  - Concerns over reliability of inter-bank rates such as LIBOR
  - Widening swap spreads
  - Other reference rates: SONIA, REPO

FIRM Board established working party in late 2007 to investigate...

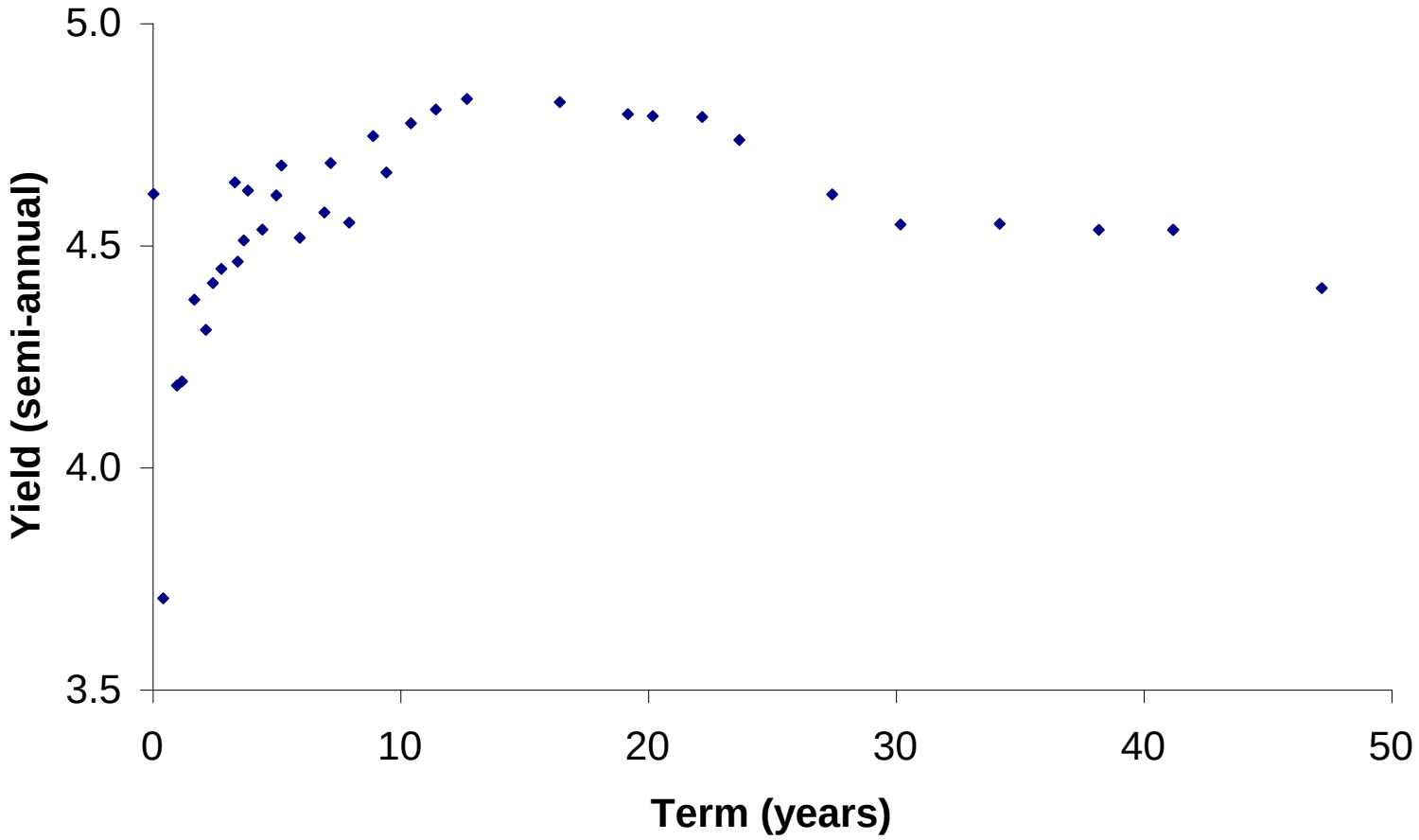
Workshop Agenda

- What are the possible references for risk-free discount rates?
- Why are bank risk free rates different from gilt risk free rates?
- What are the arguments for “illiquid” risk free rates?
- Conclusions

FRS 17 Refers to AA Bonds

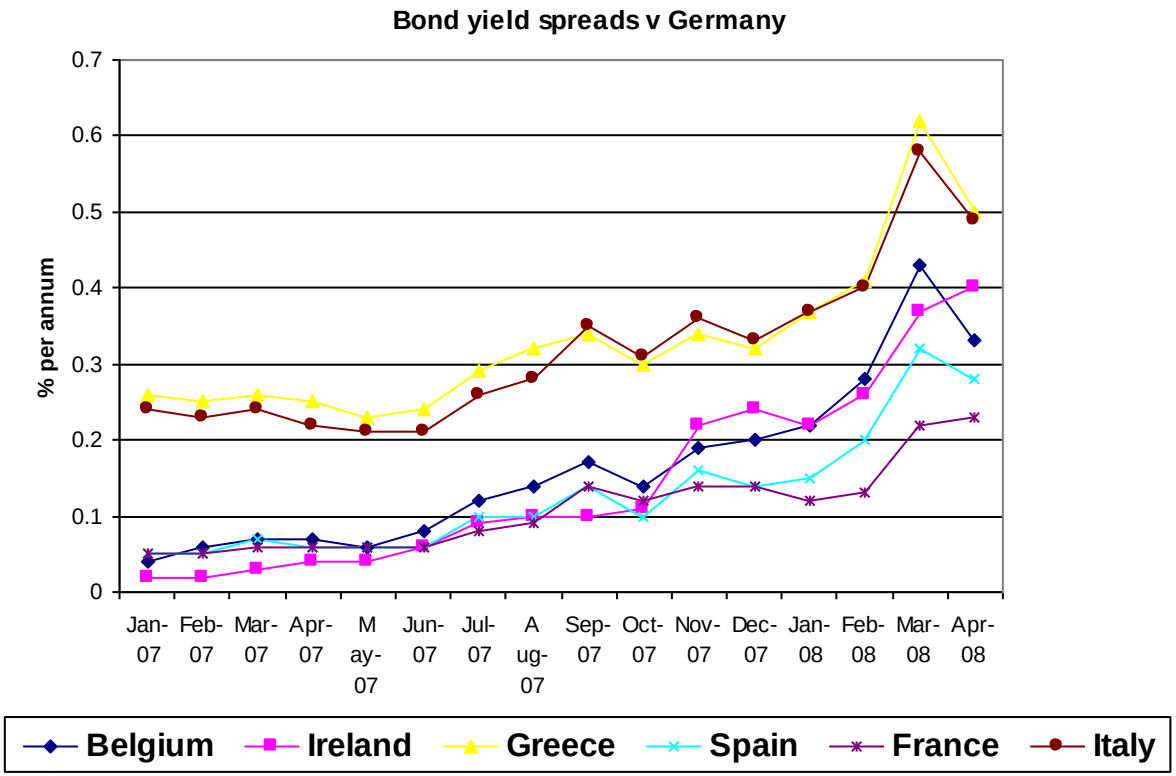


Gilt Yields



Source: DMO, run date 22 September 2008

Benchmarks are Averages of Actual Trades



Example of a risk on government debt:

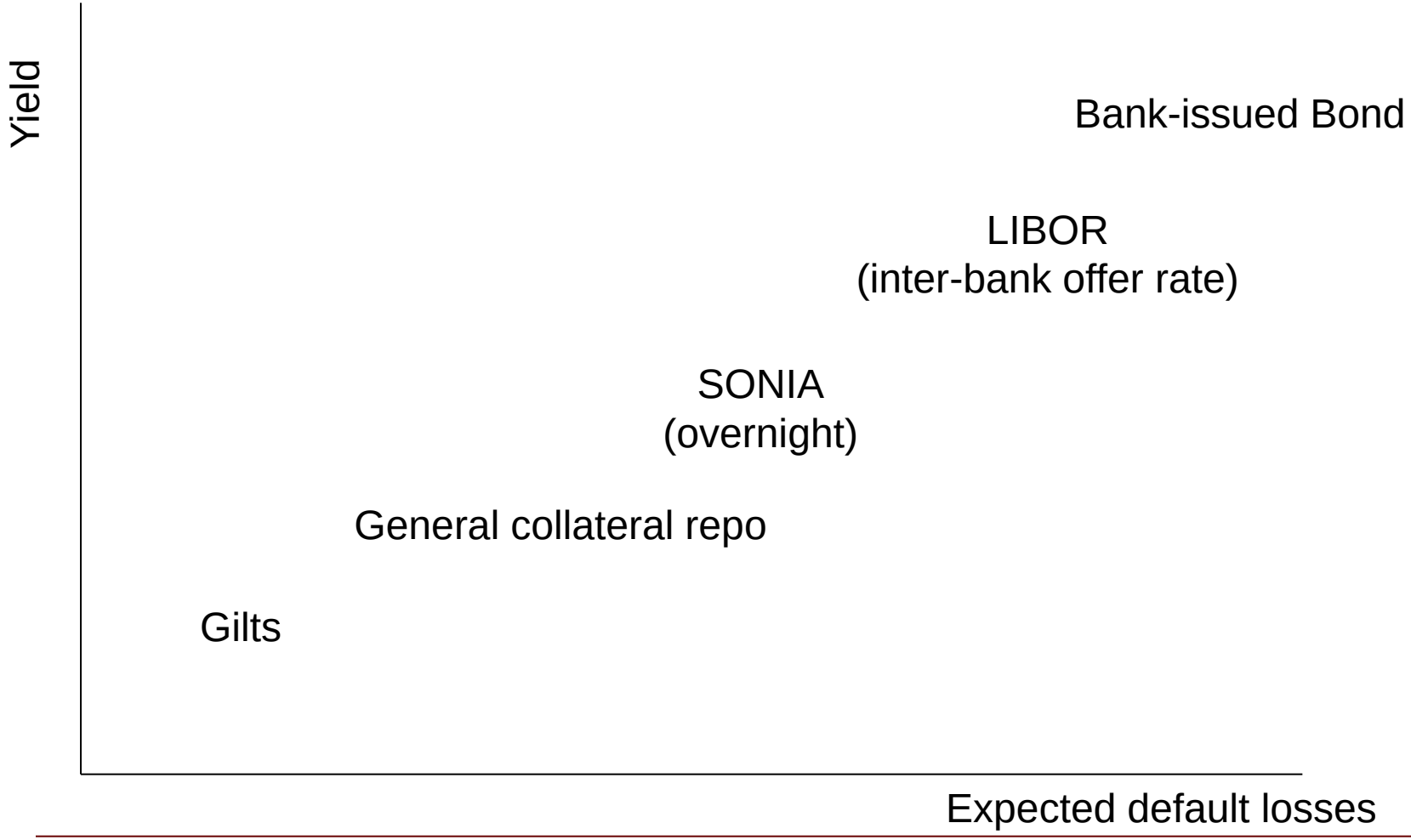
Euro-denominated bonds face uncertainty in the event that an issuing government leaves the Euro zone and seek to redenominate its national debt into a national currency.

Source: ECB

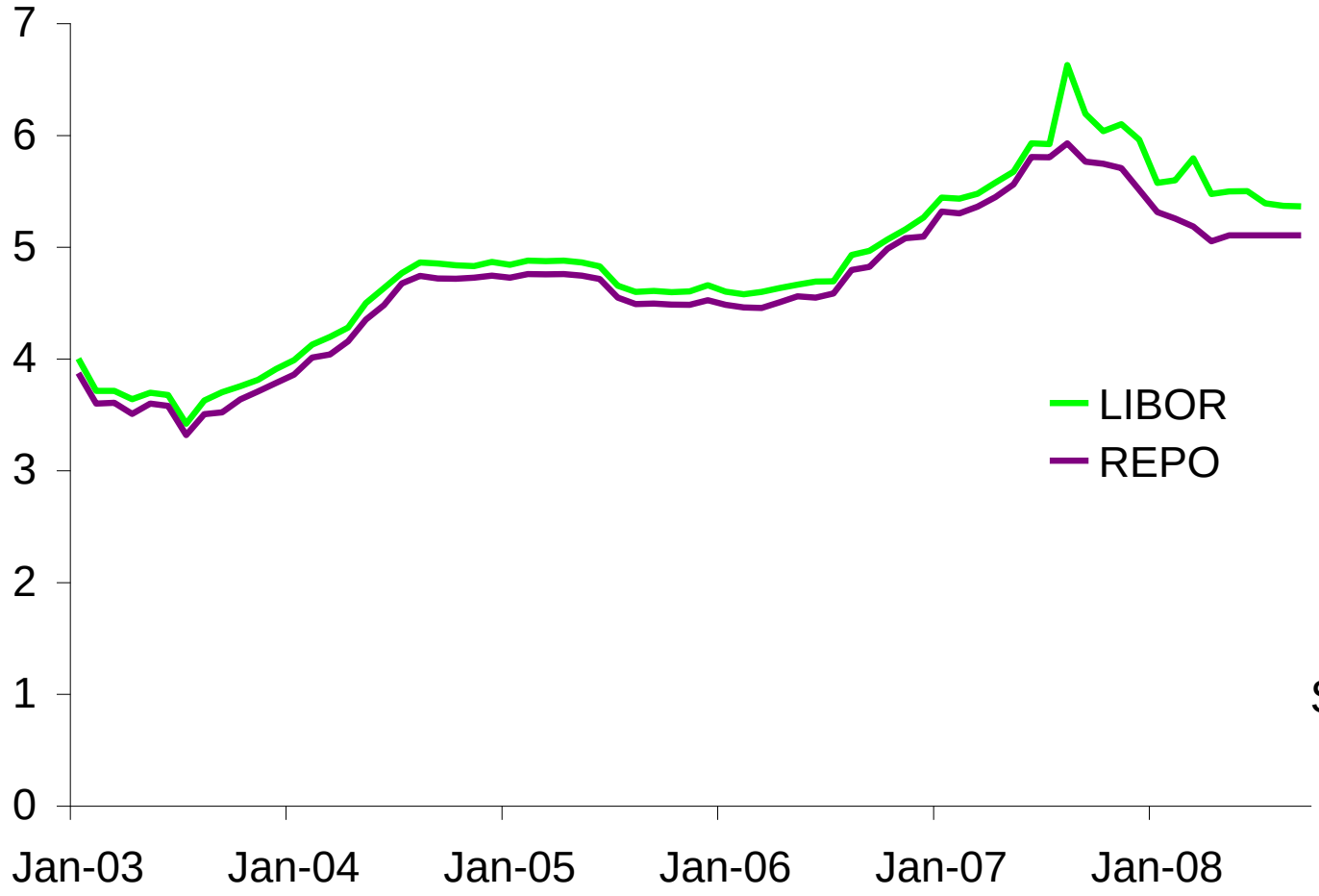
Inter-Bank Market Rates

- Term deposits between banks on unsecured basis.
- Offer-side interest rates (the bid side is called LIBID)
- Very limited secondary market.
- Data collected through a survey of a panel of commercial banks (NOT investment banks)
- Submitted rates are diverse; published LIBOR is an average.
- ‘General Collateral’ and repo rates

Comparison of Rates

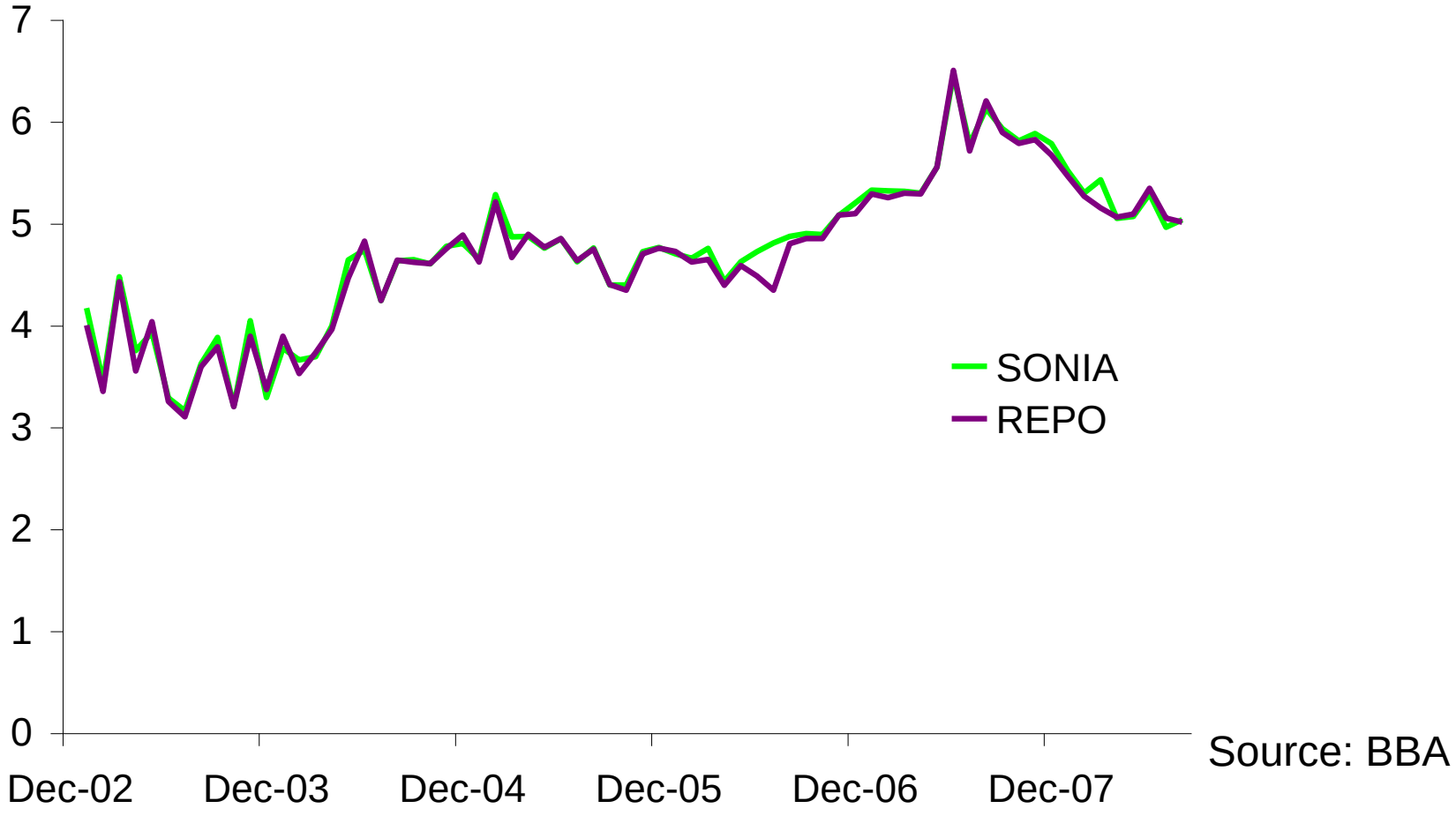


Sterling 1-month LIBOR vs REPO
Effect of Collateralisation



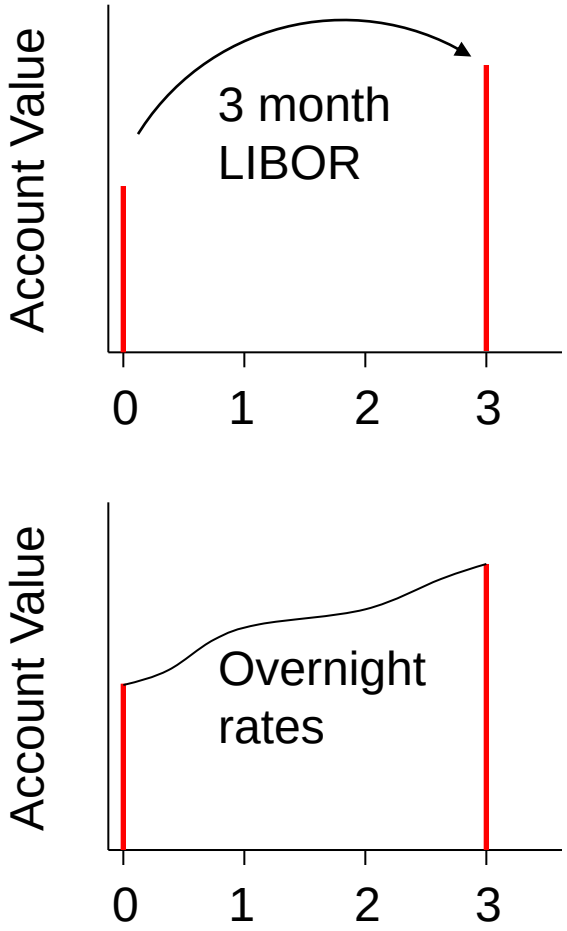
Source: BBA

Sterling Overnight Rates
Sonia vs Repo shows little collateral effect



Source: BBA

Value of Refreshing

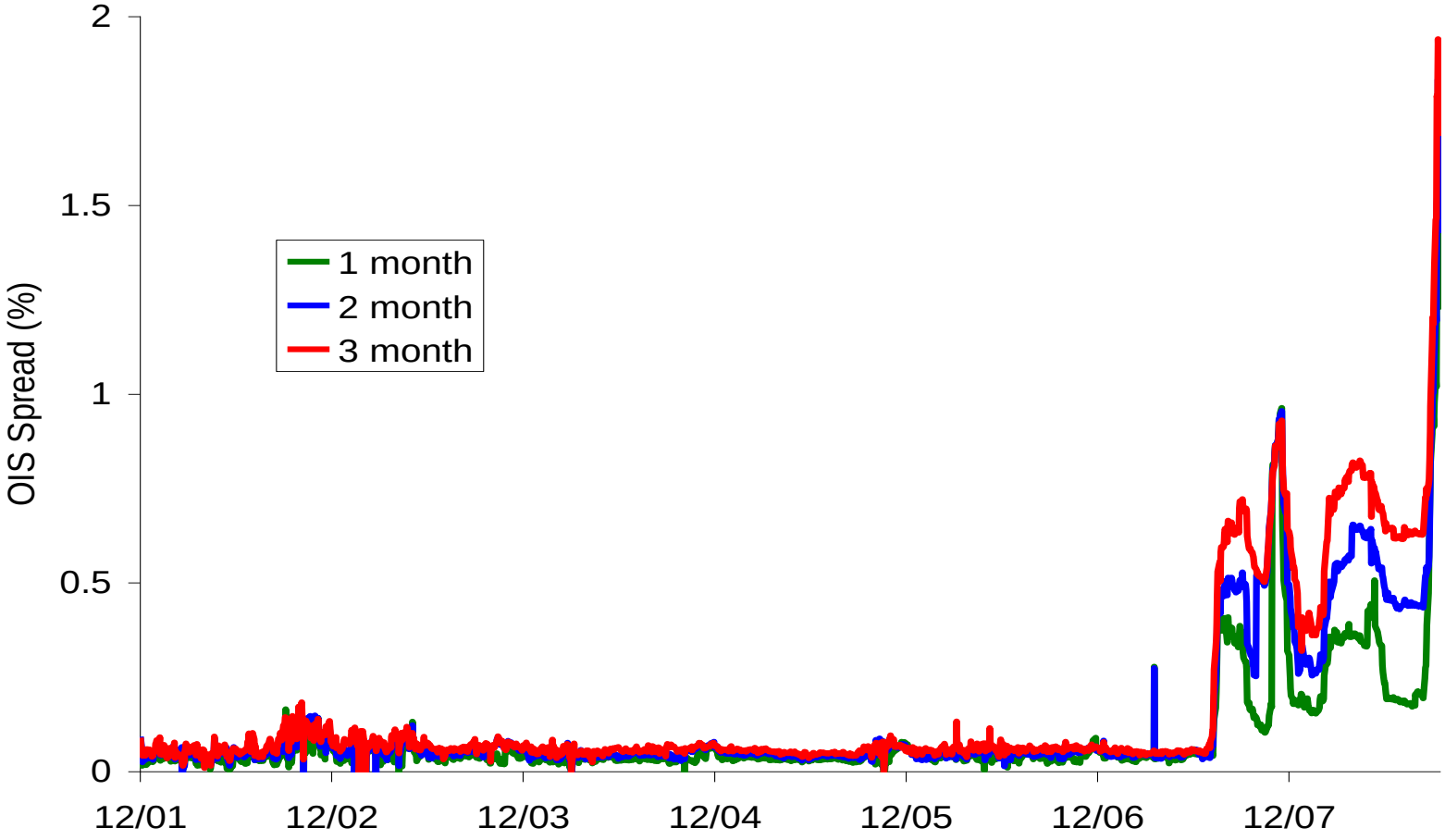


Locked in: A 3-month LIBOR deposit is with one bank, and the depositor risks loss if that bank fails.

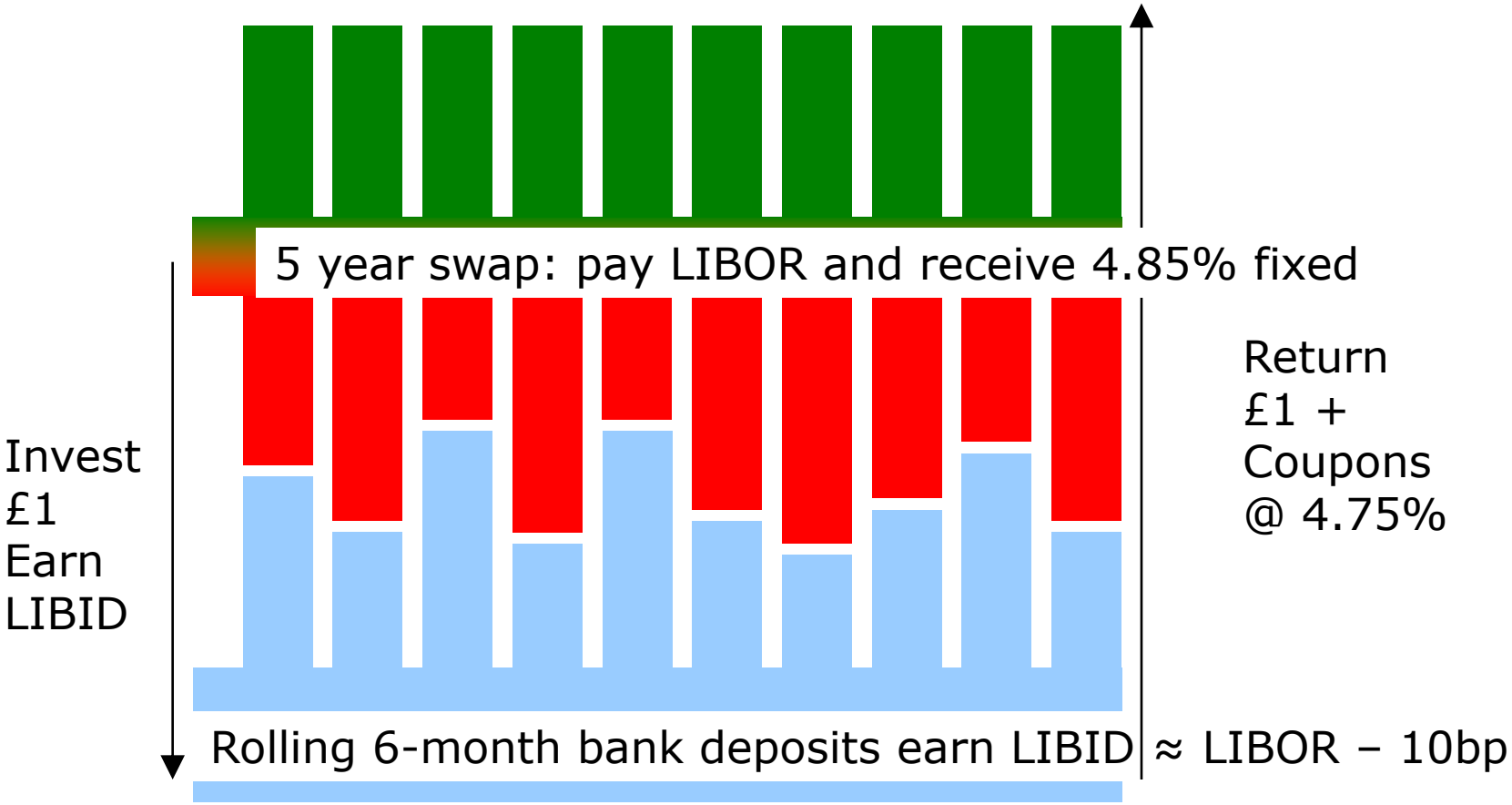
Refreshing: The option to move deposits between banks daily. Refreshing is valuable because the investor can switch between banks to mitigate credit risk.

Overnight Indexed Swap: A derivative to swap the total return at overnight rates for a fixed rate.

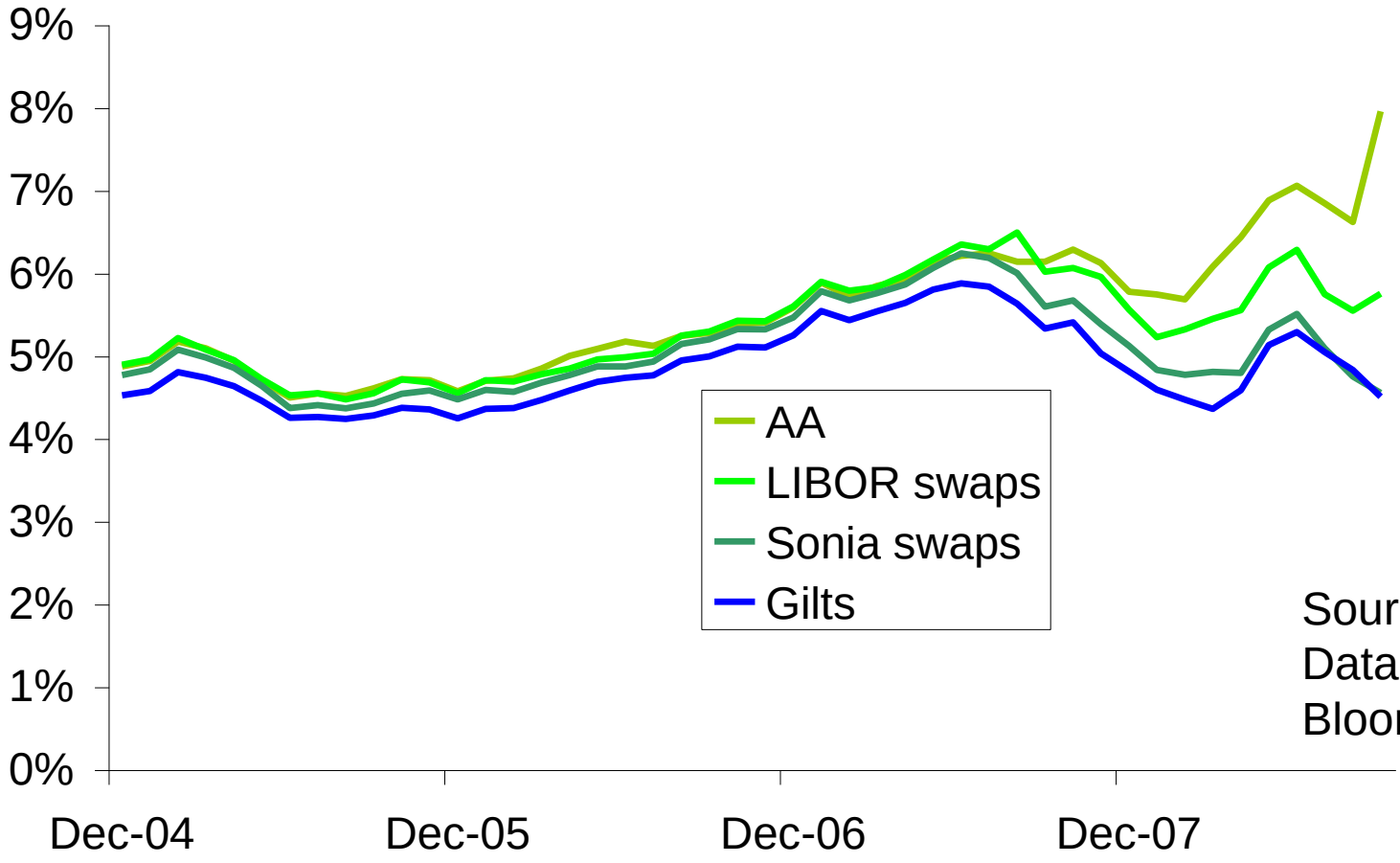
The Value of Refreshing: EURIBOR vs Overnight Indexed Swaps



Extending Yields via Swaps

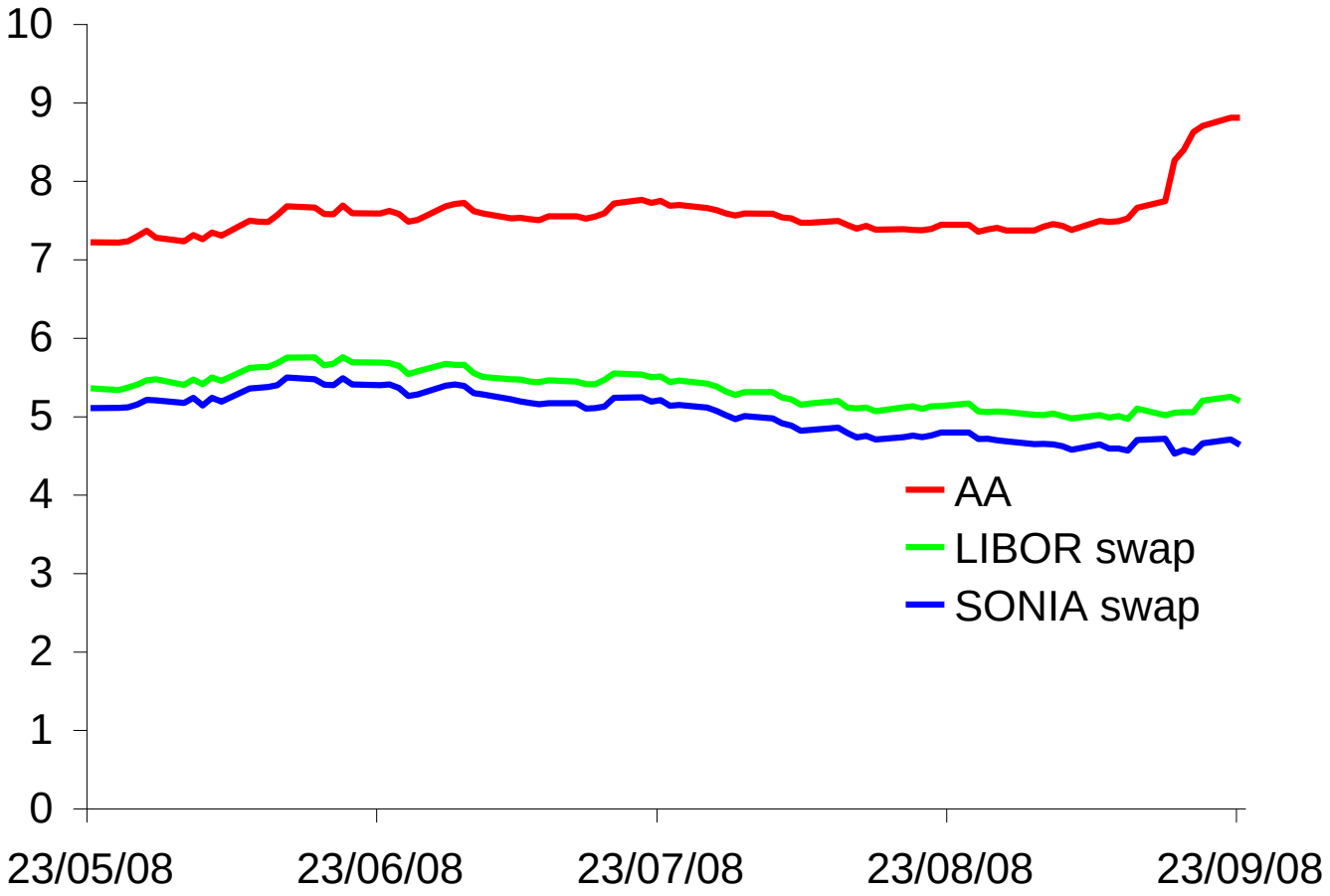


Evolution of 1-Year Sterling Rates
Gilts vs Swaps x2 vs AA



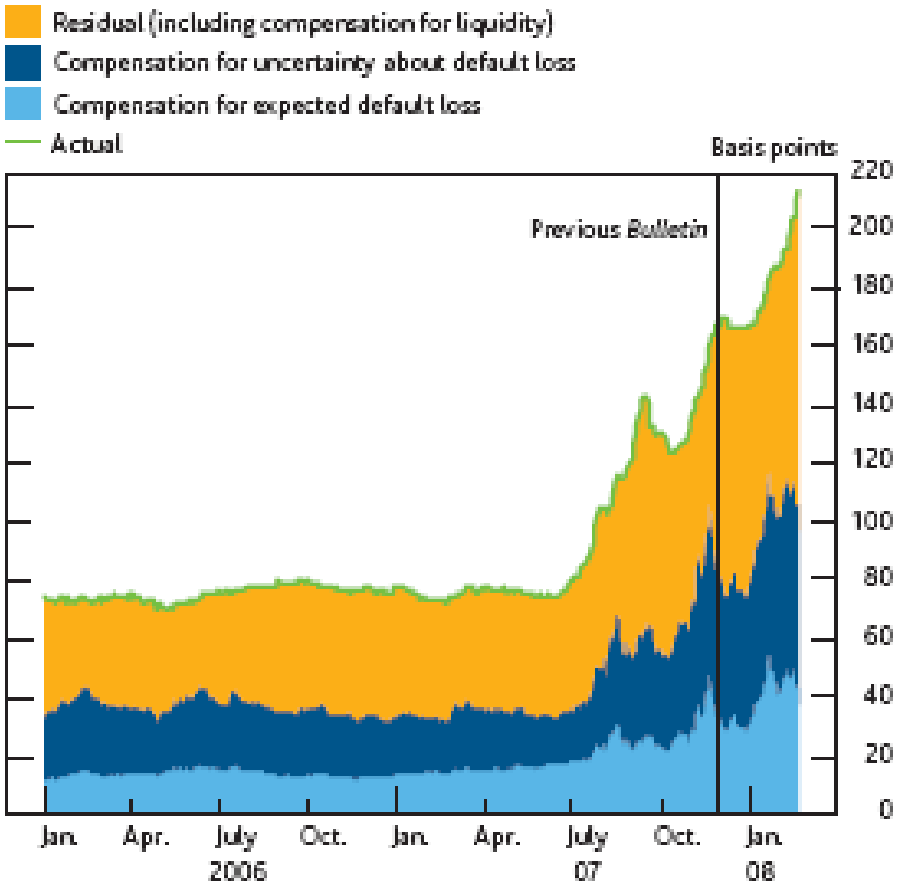
Source: Datastream, Bloomberg

10 Year Rates: AA vs LIBOR swap vs SONIA swap (recent history only)



Source: Datastream, Bloomberg

Corporate bond spreads (investment-grade)

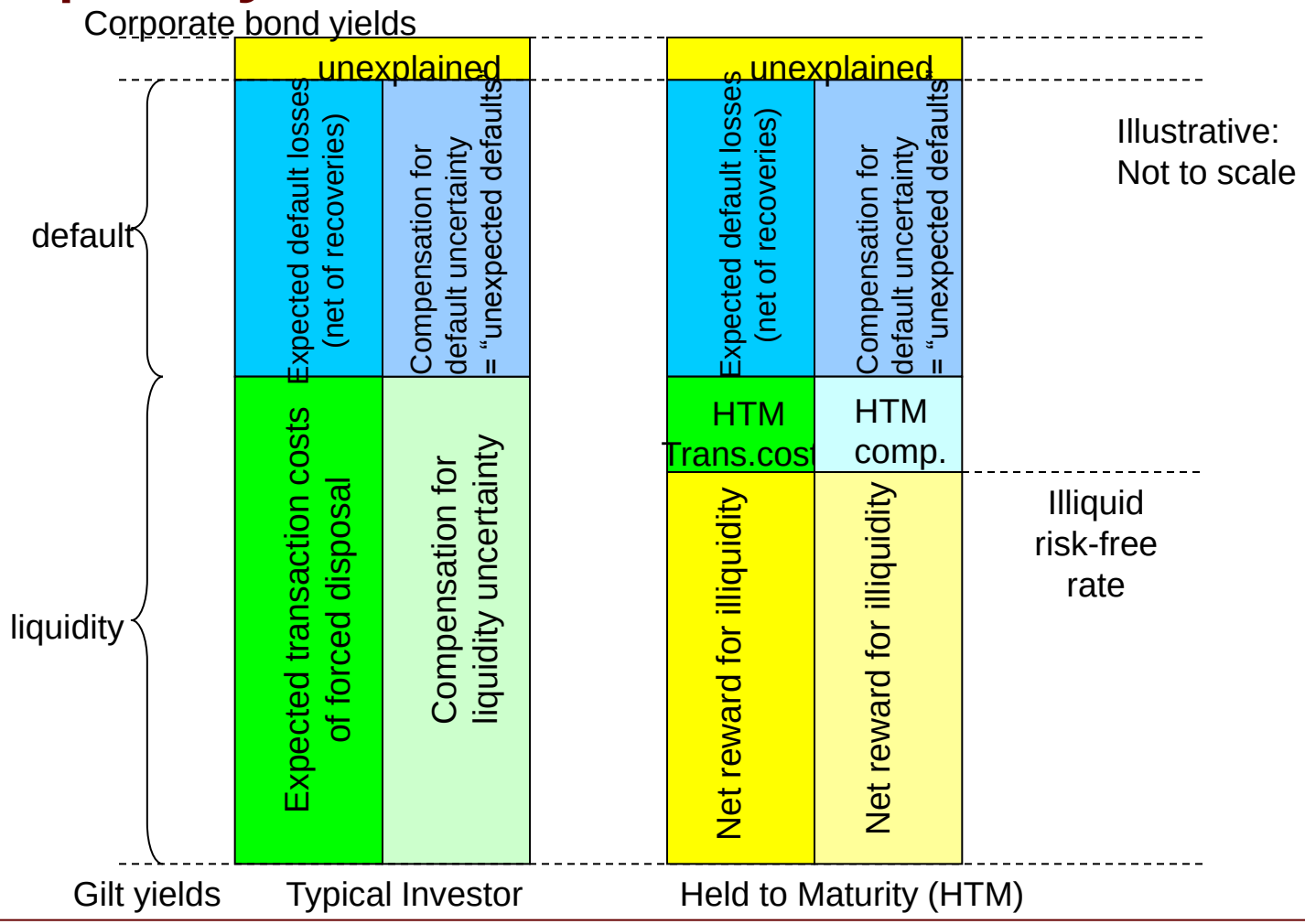


The attached research (from B of E) does not provide a separation of the 'residual' spread into illiquidity premium and other components.

This residual may include weaknesses in the underlying Merton model for capturing the default element.

In addition, the model calibration used assumes that there is no illiquidity component in the equity return assumption.

Illiquidity Effects



Liquidity characteristics of liabilities

- Most life insurer liabilities and pension scheme obligations are long-term in nature.
- However, even within long-term contracts, there are significant differences in terms of liquidity:
  - Unit-Linked liabilities.

    These can be considered to be exactly as liquid as the corresponding assets.
  - Non-linked liabilities

    Annuities are highly illiquid – the timing of outflows for a large portfolio is near certain (in adverse scenarios additional assets are required)

  Others may depend on explicit/implicit terms of policyholder contract
- Investors with illiquid liabilities may take account of asset illiquidity rewards in liability pricing

Defining the “Risk Free” Rate

- High credit quality bonds also tend to be …
  - liquid (little scope for information asymmetry)
  - convenient to hold (low expenses for default risk management)
- So we cannot easily extrapolate to zero credit risk, positive liquidity premium, positive convenience yield
- Sometimes “risk free” is taken to mean “reference rate”
  - For example, CEIOPS (QIS 4) appears to interpret “risk free” in this way
  - Requirements include deep and liquid market
  - “Risk free” not to be taken literally, even governments default sometimes
  - Used to imply gilts, now means LIBOR swaps, may in future be SONIA swaps

Conclusions

- Risk of default is everywhere; no rates (even gilts) are completely free of risk
- Bank “risk free” rates, based on swaps, are higher than gilts mostly because of credit risk
- Illiquid investments carry an illiquidity premium, which may reduce liability transaction prices, but calibration is neither objective nor robust.
- Some sections of our working party report available at:

http://www.actuaries.org.uk/__data/assets/pdf_file/0010/134011/MarketConsistentValuation.pdf

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Thanks!

WP Colleagues:
Seamus Creedon
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Antoon Pelsser
Colin Wilson