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Recent Developments in Bond Investment

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Recent Developments in Bond Investments

- Credit Spreads and the Quest for Yield
  - Supply and Demand for Long Bonds
    - Credit Default Swaps & CDOs
      - Synthetic RPI & LPI exposures
        - Longevity Bonds & Liability Matching

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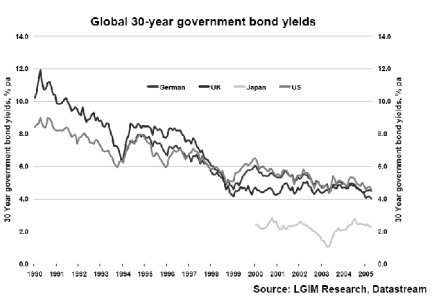
Falling bond yields…



Source: LGIM Research, Datastream

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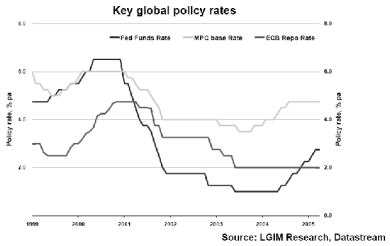
Low interest rates…



Source: LGIM Research, Datastream

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Have led to a demand for yield

- From Pension Funds wanting to match liabilities and mitigate the effect on funding from switches from equities
- From Life Insurance Companies, matching liabilities and competing in the market
- From Retail Investors uncertain about equities and facing low yields on cash

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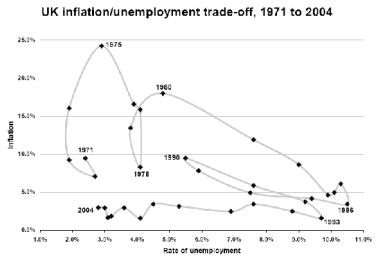
This demand + economic stability…



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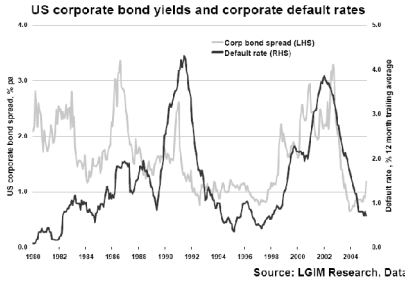
… and low default rates have led to falling spreads on bonds



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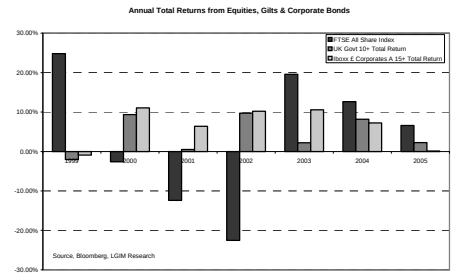
Resulting in a good period for corporate bond investment…



Calendar years except 2005, to 9th May

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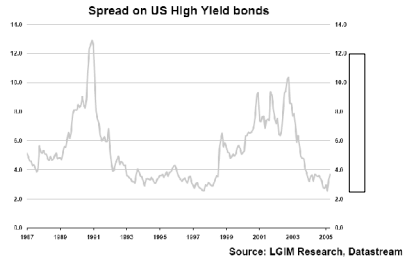
But compensation for risk has fallen…



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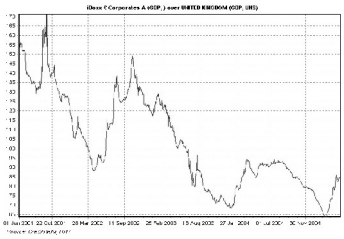
… e.g. historical spreads on UK A rated bonds



Spreads over Gilts reached a historic low in March, before bouncing back to (still low) 2004 levels

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Compared to historical loss rates…

Average annual loss rate for bonds of given maturity, based on Moody's Issuer-Weighted Default Rates, 1920 - 2003 with 40% recovery

Year:	*1*	*5*	*10*	*15*	*20*
AAA	.00%	.02%	.06%	.07%	.06%
AA	.04%	.10%	.16%	.20%	.19%
A	.05%	.15%	.20%	.24%	.23%

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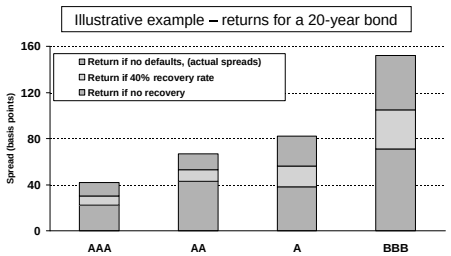
… there is still a reward for holding credit



Default rates are for worst cohort of cumulative defaults on 20 year bonds, Moody's issuer weighted study 1970 – 2004. Spreads as at 10 May 2005

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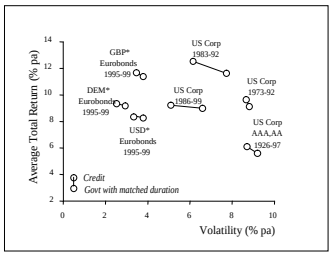
… in line with empirical studies showing
higher return + lower volatility for investment in credit



Sources: Bennett, Esser and Roth 1994 "Corporate Credit Risk and Reward", *The Journal of Portfolio Management*, Spring.
Coughlan 1999 "The Risk-Return Characteristics of European Credit". *JP Morgan Research Paper*
Ibbotson Associates 1998 : *Stocks, Bonds, Bills and Inflation 1998 Yearbook*

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Credit spreads – discussion points

- Did investment in credit still make sense for pension schemes in March 2005 when credit spreads were at a low point?
- What is the outlook from here?

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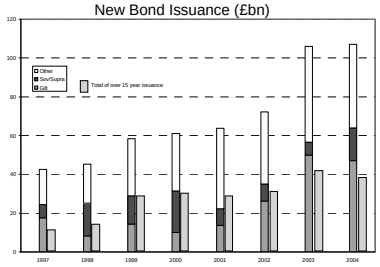
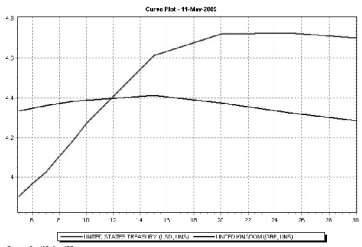
Supply has grown but not kept pace with demand particularly for longer maturities

New Bond Issuance (£bn)

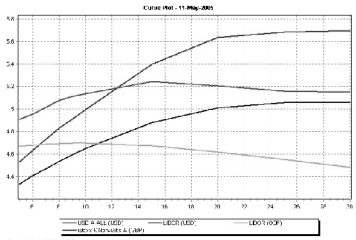


Fiscal years (Gilt issuance) are shown with Calendar Years

Resulting in a downward sloping yield curve for Gilts

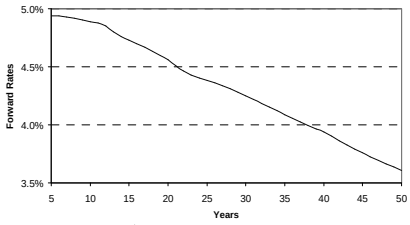


… and Credit



Forward Interest Rates

Interest rates earned for a one-year LIBOR investment starting in the future

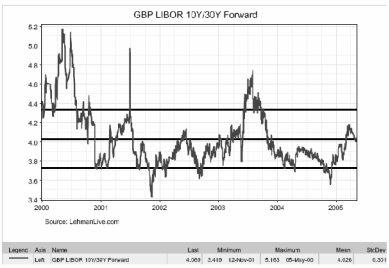


Forward calculated from sterling mid swap rates, ICAP 9th May 2005

1 year rates, 30 years forward

Rates have increased, partly anticipating the effect of long Gilt issuance, but are still relatively low

10 year rates, 30 years forward



The average rate between 30 and 40 years has only recently moved over 4%

Ultra Long forwards

- Is it a good idea to match long duration liabilities with bonds, locking into sub 4% rates?
- What are the alternatives?

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Credit derivatives

- Ability to hedge cash markets
- Improved liquidity (market size 1998 ~ $250bn, now ~ $8,000bn)
- Diversification via structured products
- Short durations are a disadvantage but can be addressed through swaps

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Current market trends

- Good liquidity in iTraxx tranche trading
- Active market participation by hedge funds
- Constant Maturity Credit Default Swaps
- More complicated CDO structures including:
  - CDOs investing in other CDOs
  - Exotic underlying investments – e.g. trigger swaps
  - Structuring within CDOs e.g. CPPI
  - Costs / fees for some structures are not insignificant…

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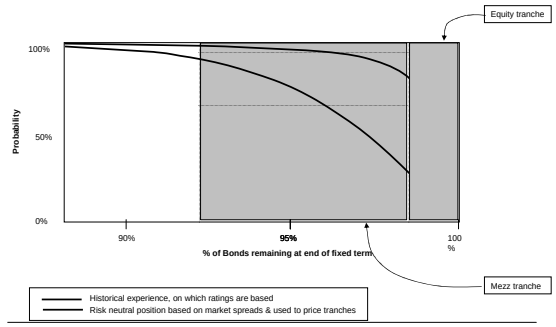
Recap on CDO rationale – history view v risk neutral pricing



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Illustrative synthetic CDO pricing

Portfolio with average rating of A and spread of 60bps

	Principal Amount	%	Spread in bps	Spread Paid
Super Senior	£4,650,000,000	93%	10	£4,650,000
AAA	£50,000,000	1%	50	£250,000
AA	£50,000,000	1%	100	£500,000
BBB	£100,000,000	2%	300	£3,000,000
Equity	£125,000,000	2.50%	1,700	£21,600,000
	£5,000,000,000	100%		£30,000,000

Success of synthetic CDOs has much to do with cost of hedging the Super Senior tranche which does not have to be taken in funded form. Costs have been well below the 10bps shown in the illustration, particularly for 5 year deals, but have increased recently

Spreads are all quoted relative to LIBOR

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Discussion points

- Are CDOs a sensible part of the portfolio of a pension scheme?
- Do Trustees need to understand the products?
- Is the structured market now driving the cash market?

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Synthetic RPI, LPI

- In principle very simple to create a 'synthetic' RPI Bond from a conventional Bond

Pay under swap	*Receive under swap*
Schedules of Bond Cashflows	Schedule of RPI Cashflows

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Synthetic RPI, LPI

- Swap pricing is based on swap break-even inflation 'BEI'
- Swap BEI is more expensive than Gilt BEI…
- …but this is offset by positive swap spread (over Gilts) …
- …and the reward for taking credit risk
- Overcomes the lack of supply / poor diversification of RPI linked corporate bonds
- Credit risk can be taken at shorter maturities and swaps (collateralised) used to create duration match to liabilities

Synthetic RPI, LPI

- Costs are wider than for fixed swaps
- RPI is now a liquid 'screen tradable' market
- LPI not there yet
- Collateral management will be the main practical consideration

Discussion points

- What are the obstacles to higher credit exposure in RPI linked bond portfolios?
- Is a conventional bond portfolio swapped to RPI or LPI a superior alternative to Index Linked Gilts for pension schemes?

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Liability matching solutions

- Liability driven investment solutions depend on knowing what the liabilities are and what the rules are for calculating their values
- Liabilities can only be estimated within a considerable margin of error
- There are several choices for valuing liabilities, all have short-coming particularly the FRS17 basis
- One of the main drivers of liabilities can not be matched with currently available investments

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Several matching approaches have credibility…

- Matching early year cashflows with bonds, longer term with equities and property
- Matching different groups with different assets e.g. pensioners with bonds, active member liabilities with equities
- Swapping out all interest rate and inflation risk and investing against a cash benchmark

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Longevity bonds are theoretically attractive…

- Increasing life expectancy is a real threat to pension schemes

Life Expectancy for males

Age	1981	1991	2001
65	13.0	14.2	16.0
75	7.7	8.5	9.6
85	4.3	4.7	5.1

England and Wales population data; no allowance for future mortality improvement

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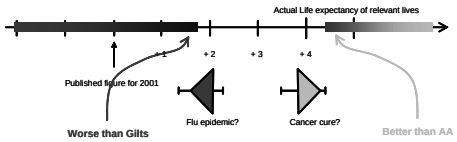
A Longevity Bond produces a better return if the reference population lives longer…

Schematic example of one approach to comparing the return to other investment bonds



- Possible question: How much longer do people have to live for a longevity bond to produce a better return than a typical BBB rated bond?

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Discussion points

- What can schemes with deficits & equities do about matching liabilities?
- Is rough duration matching for interest rates and inflation enough in most cases?
- Will the new pooled fund solutions find a ready market?
- Will a market develop in Longevity Bonds?

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