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PUTTING ECONOMICS INTO PENSION FUNDS
26TH JUNE 2007, LONDON

Structured Products: Credit derivatives and pensions
Kerrigan Procter, Legal & General Investment Management

Introduction

Credit products

How they can be used by pension schemes

Relevant valuation techniques

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Separating Liability Matching from Asset Allocation

PROCESS	Swap or Derivative Instrument Used
Step 1: Swap inflation-linked liabilities for fixed liabilities out to the same maturity.	Inflation swaps
Step 2: Swap long-dated fixed liabilities for floating rate liabilities.	Interest rate swaps
Step 3: Buy floating rate assets to back floating rate liabilities. But can choose to move away from the matched portfolio: equity (currency hedged), credit (global/sterling), hedge funds, commodities, …	Equity options Credit derivatives

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Credit Default Swap Example

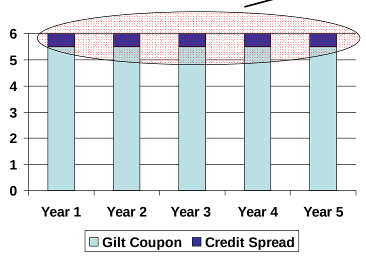
"Insurance premium" aka credit spread
e.g. 0.50% pa for 5 years

BANK → CDS ← PENSION SCHEME

Scheme will "make whole" the bank
if a particular bond defaults
within 5 years

Gilt + CDS like a corporate bond

Credit spread can be received separately using CDS



Gilt Coupon
+ Credit Spread
= Corporate Bond Coupon

Credit Risk Transfer

CDS

Commercial Banks	Investors in Credit Assets	Contingent Credit Risk
• Loan accumulation • Mortgages • Credit cards • Leases	• Insurance companies •Pension funds • Hedge funds	• Reinsurance/monolines • Sponsor default risk for pension schemes • Derivative counterparty risk

Positive/Negative Basis

- Pricing difference between cash and synthetic market:
  - Technical Factors – contract details and types of user
  - Market Factors
- Positive basis:
  - CDS spread/premium > corporate bond spread over LIBOR
- Negative basis:
  - Arbitrage example – buy corporate bond and buy credit protection using CDS to get risk-free return over LIBOR

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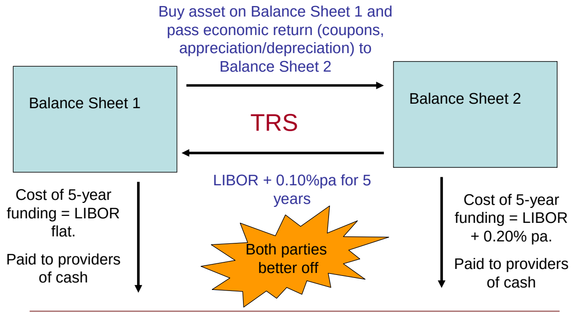
Total Return Swaps – Efficient Funding



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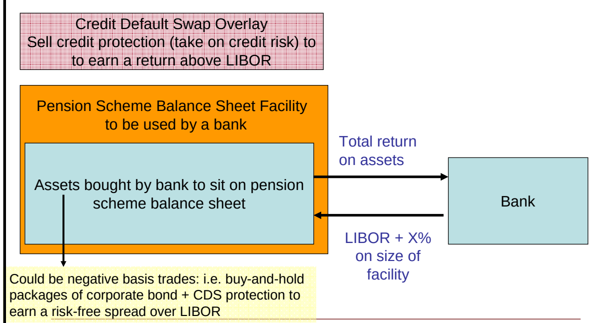
Credit Derivatives Everywhere!



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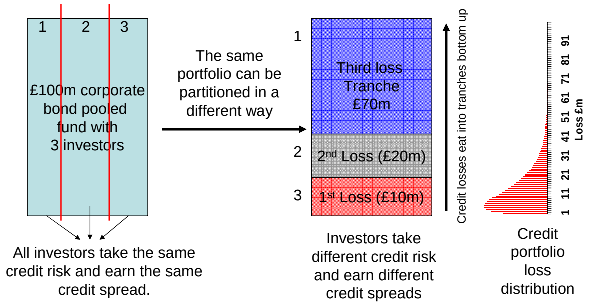
CDS Indices

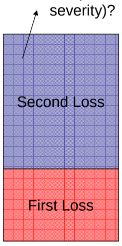
- CDS Index – A pool of single name credit default swaps.
- The two most liquid investment grade indices are:
  - CDX US IG – 125 most liquid single name referenced credit default swaps in the US market
  - iTraxx Europe IG – 125 most liquid single name referenced credit default swaps in the Euro market
- Liquid in 5, 7 and 10 year maturities
- Fast and efficient asset allocation across global credit markets.

CDOs and Tranches



What affects the value of tranches?

What makes the second loss tranche more valuable (lower loss severity)?

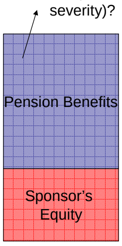


1. More subordination (size of first loss tranche)
2. Diversify assets in whole pool – less likely to eat far into second loss.
3. Less risky assets in pool – but will reduce spread.

- Theoretical pricing of second loss tranche by simulation: credit spread applied to cashflows should compensate second loss investor for expected losses.

What affects the value of pension liabilities?

What makes the members’ benefits more valuable (lower loss severity)?



1. More subordination (better covenant)
2. Diversify assets in underlying pool – how will value behave on company default?
3. Less risky assets in pool relative to benefit cashflows.

- Theoretical pricing by simulation: spread applied to benefit cashflow valuation could allow for expected losses.

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Summary

- CDS
  - Transferability of credit risk
  - Investment flexibility
  - Tactical asset allocation using indices
- TRS
  - Efficient allocation of funding
- CDOs and tranches
  - Tailor risk/return profile
- Value pension benefit cashflows like CDO cashflows?

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