Credit Portfolio Management with Significant Use of Back-End Tools

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Agenda

Business Model and Philosophy

- Structure
- Process
- Approach

Anatomy of a Loan Portfolio

- Liquid vs. Illiquid
- Spread Curves

Mark to Market Pricing with CDS

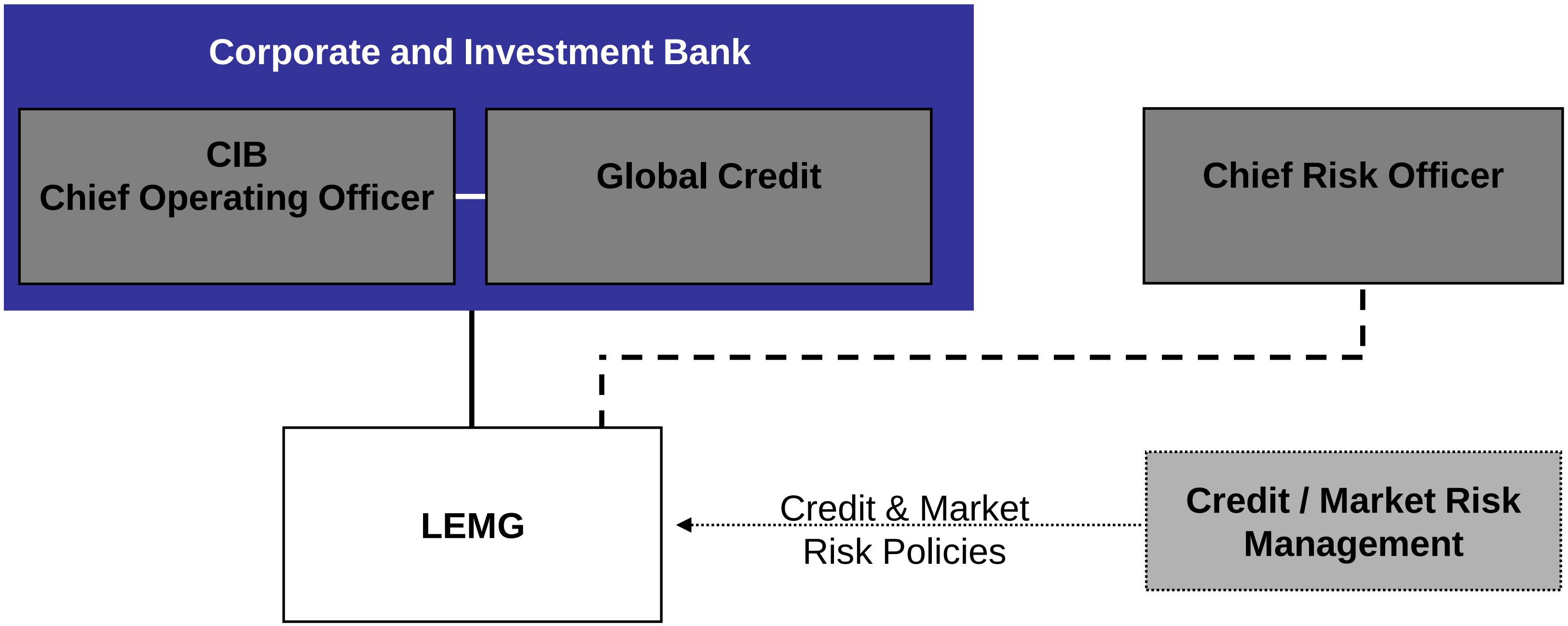
Pricing with CLO Spreads

Other Issues

Summary

Business Model and Philosophy

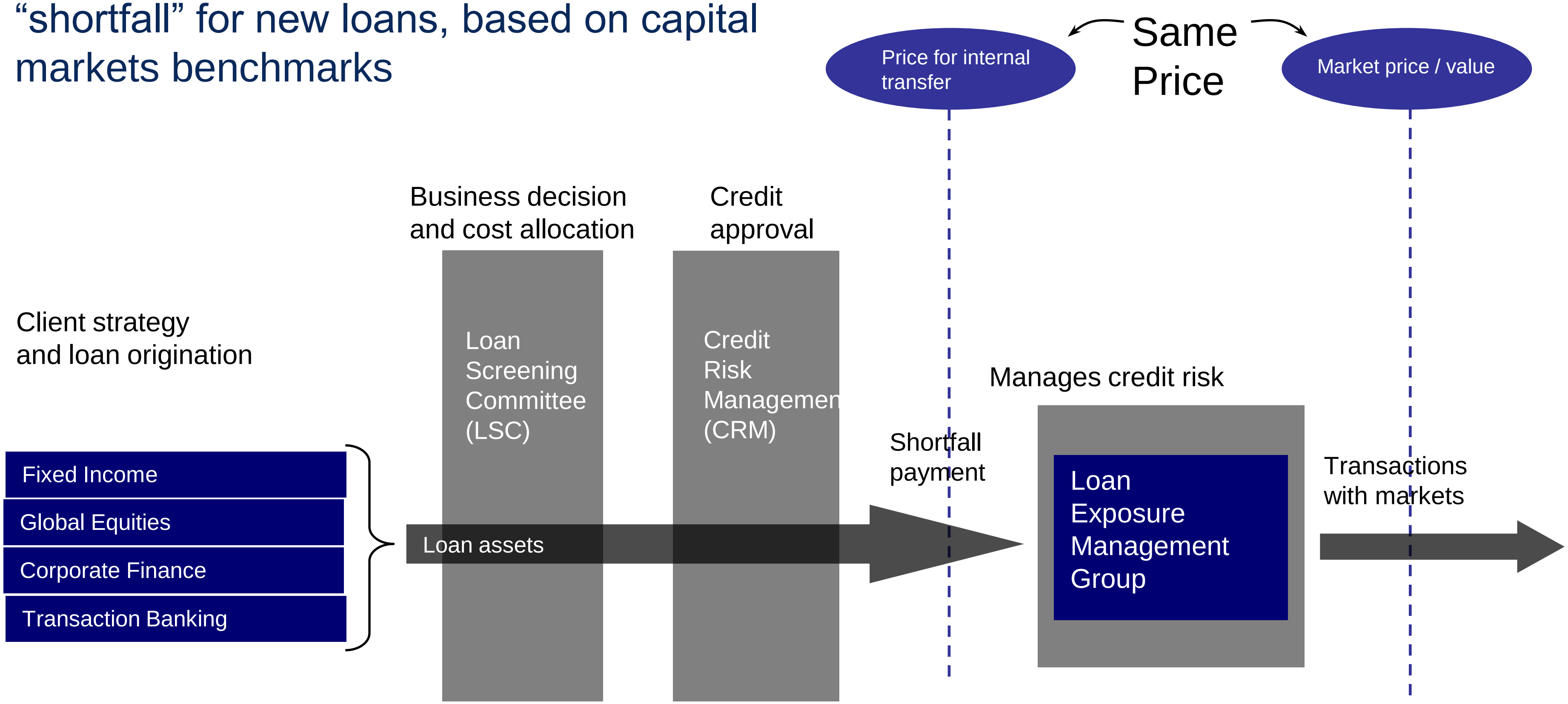
Loan Exposure Management Group (LEMG) is a separate division of DB's Corporate and Investment Bank



- *Independent function*
- *Capital market discipline*
- *Clear accountability for loan portfolio*

Business Model and Philosophy

LEMG quotes an internal transfer price or "shortfall" for new loans, based on capital markets benchmarks



Sponsoring business divisions pay shortfall and loan is transferred to LEMG

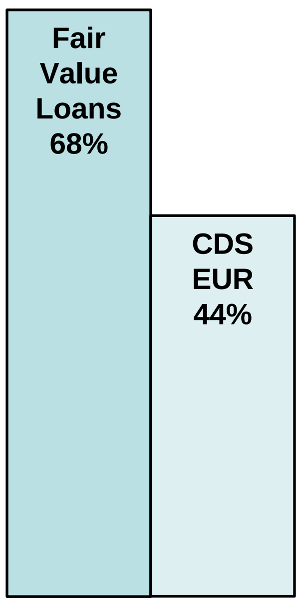
Business Model and Philosophy

- LEMG takes a “rational investor” approach to the loan portfolio
- LEMG charges business units what it would cost to place the same credit back into the market
  - Mark-to-hedge philosophy
  - A fair price for using the Bank’s capital/balance sheet

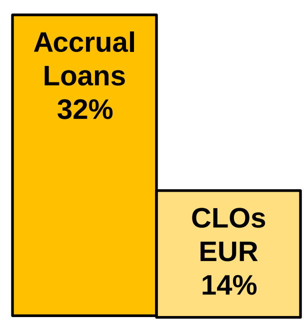
- The cost of placing the credit back into the market
  - Market price – CDS curve, CLO pricing
  - Liquidity costs, especially for large notional sizes
  - Funding costs, especially for unfunded commitments

Anatomy of a Loan Portfolio

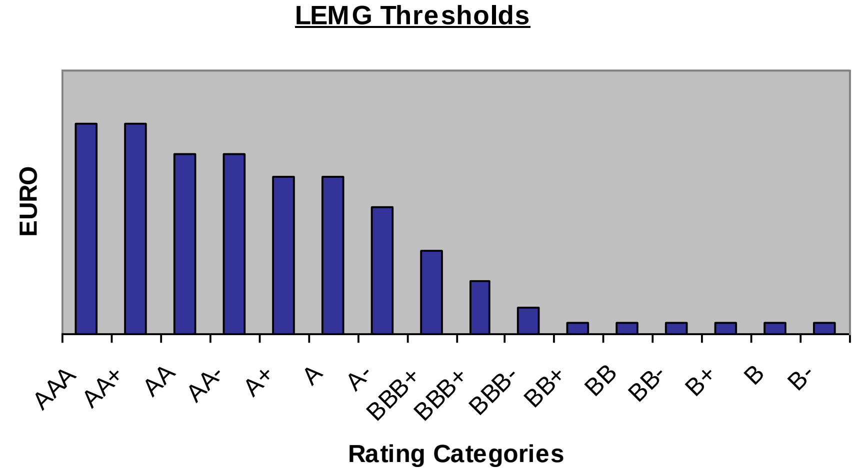
LEMG's international portfolio is comprised of "large-cap" borrowers



Mark to Market/Tradable



Accrual/Illiquid



Increasing probability of default

Data as of 4/28/2011

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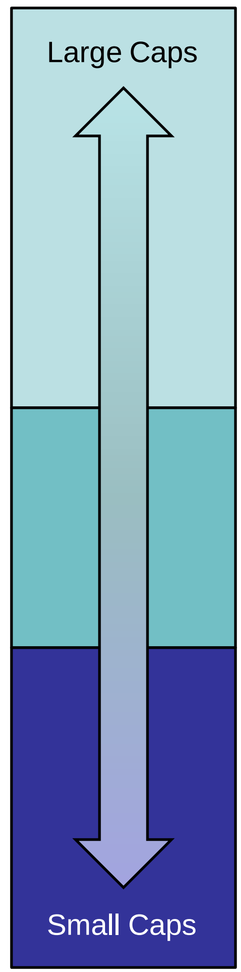
Anatomy of a Loan Portfolio

Liquidity Spectrum



Hedging Strategy	*Borrower Characteristics*
Credit Default Swaps (CDS)	Large companies, frequent issuers of bonds
Tailored structured solutions Credit Linked Notes (CLN) Financial Guarantees	Companies with large bank debt positions, but few bonds and CDS
Collateralized Loan Obligations (CLO)	Companies that solely rely bank financing

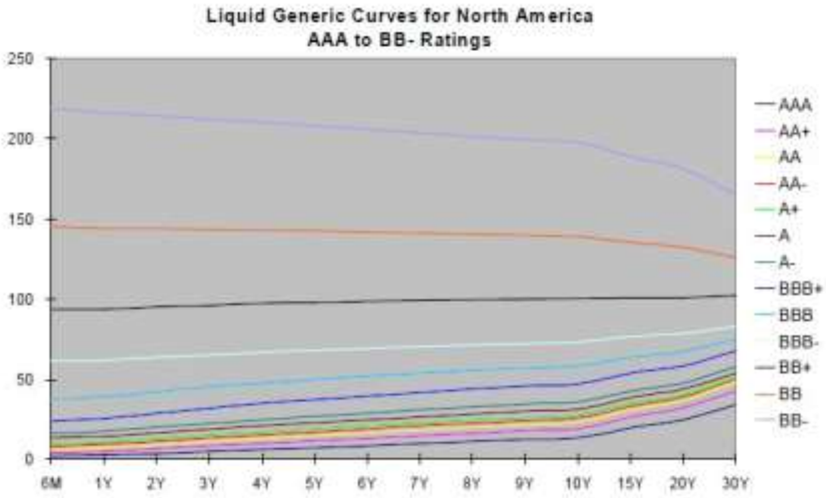
Anatomy of a Loan Portfolio

Spread curves – credit default swap market

- Many large cap names are directly observable in the CDS market
- Taken directly from the CDS market, sometimes adjusted for tenor, size, etc.
- Roughly 1,000 names readily quoted by dealers

Spread curves – generic curves

- Spread grids are often developed from the observable quotes
- Grids are based on the maturity, rating, region and industry sector
- Reference by public (when available) or internal rating



Mark to Market Pricing with CDS

Different market spreads will lead to different shortfalls[1]

Identical facility details…

EUR 100 million commitment (expected to be unutilized)

- Tenor: 5 years
- Rating: BBB
- Facility Fee: 20 basis points (0.20%)
- Margin: LIBOR + 50

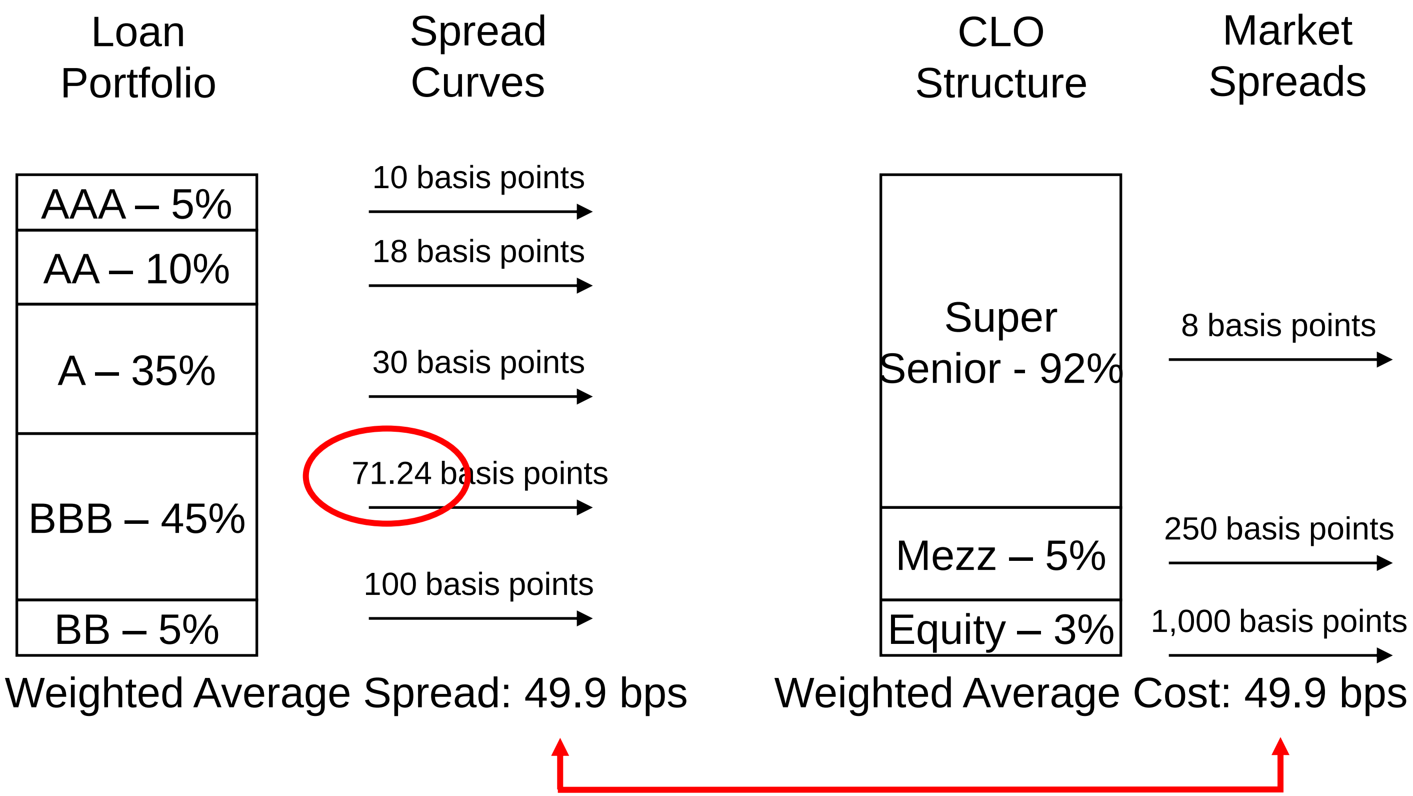
RAROC[2]	CDS Spread: 100 bp	CDS Spread: 200 bp
Mark-to-Market/Shortfall	Mark-to-Market/Shortfall[1]	Mark-to-Market/Shortfall[1]
- EUR 1,874,800	- EUR 3,440,000	- EUR 7,740,000

1) Estimated shortfall = Notional x 4.3 x [(Facility Fee – CDS Spread) / 10,000]
2) RAROC break even estimated by RWA Weight x Capital x Target Return or 42.4% x 10% x 15% = 0.636%

Pricing with CLO Spreads

"Back-of-the-envelope" CLO-based pricing

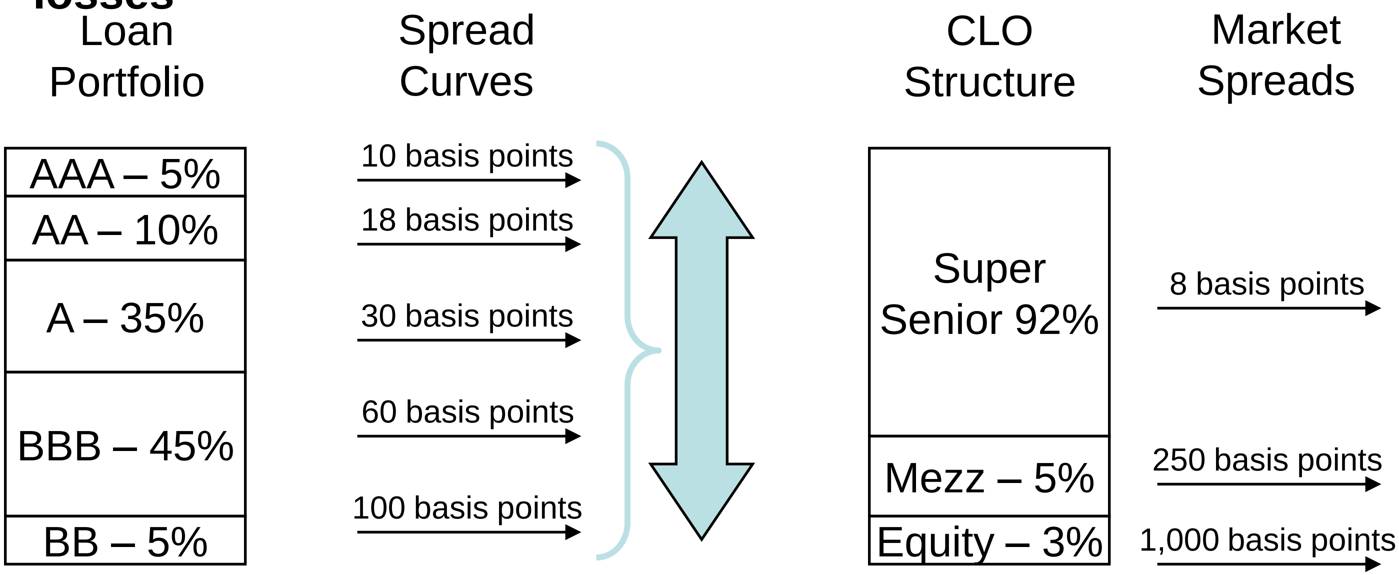
- **Establish costs of distribution through CLO tranches**
- **Map portfolio composition to spread curves, solve for levels that recover costs of the CLO**



Pricing with CLO Spreads

"Proper" CLO-based pricing

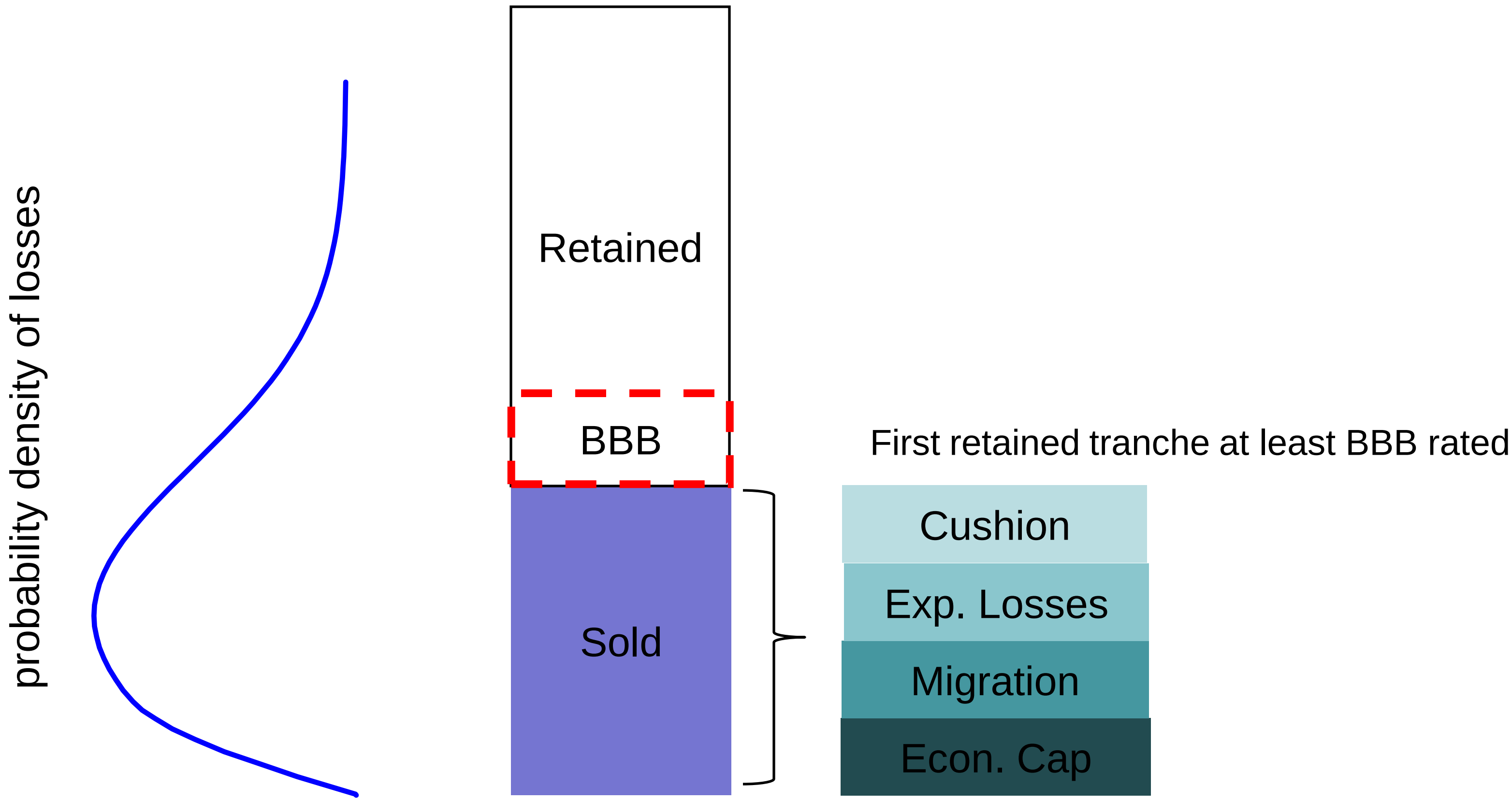
- **Calculate the implied expected loss on the portfolio from tranche spreads**
- **Adjust individual asset spread curves to match the tranche expected losses**



Adjust curves (upward or downward) such that expected loss on loan portfolio equals the expected loss on the tranches

Pricing with CLO Spreads

Sizing the Protection – Usually the bottom 8 to 20% to be sold



Deal is meant to be effective for relief over it life (not just 1 yr horizon)

Other Issues

Loan agreements often have explicit embedded options, which decrease the value of the facility (from the point of view of the lender)

- Right to repay or cancel the facility without penalty
- Right to ‘term out’ the drawn portion
- Multiple borrower facilities

LEMG’s large corporate loan portfolio consists mainly of revolvers that have uncertain funding requirements

- Before crisis, largely funded in the short-term/overnight market
- Since the second half of 2007, LEMG is working with Treasury to
  - reduce reliance on short-term funding
  - obtain long term funding for expected utilization of revolvers
  - maintain a cushion of unexpected funding for revolvers

Summary

- Mark to hedge philosophy, capital market discipline
- Transparent transfer pricing – business units are charged the cost of placing the credit back into the market
- Hedging strategy and pricing depend on liquidity

- Liquid portfolio is normally hedged with CDS
- Illiquid portfolio is normally hedged with CLO
- CLOs are sized to calibrate to a target rating

- Other complexities in valuation includes embedded options in loans and accounting for funding costs

