Financial Derivatives

A Guide to CDO and CDS

Casualty Actuaries of Greater New York (CAGNY)

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Presented by:

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Evaluation Associates

Stable Organization

- Over 32 years in the investment consulting business – one of the founding firms in the industry
- Independently managed, wholly owned subsidiary of Milliman, a global actuarial and consulting firm
- Headquartered in one central office in Norwalk, Connecticut

Diverse Client Base

- Long-term client relationships
- 125 retainer clients
- Over $200 billion in assets under advisement
- Clients include corporate and public retirement funds, insurance companies, faith-based organizations, foundations, endowments, hospitals, and financial services organizations
- Global presence

Experienced Investment Professionals

- Staff of 62 – organized to focus on client service, manager research, and compliance
- Senior professionals average 20 years of investment experience
- Management team averages 15 years at EAI
- Longstanding commitment to excellence

Origins of Credit Market Turmoil

- Historically low rates
- Search for yield
- Excessive credit extension
- Leverage
- Global market liquidity: Asia and Mid-East
- Financial market innovation

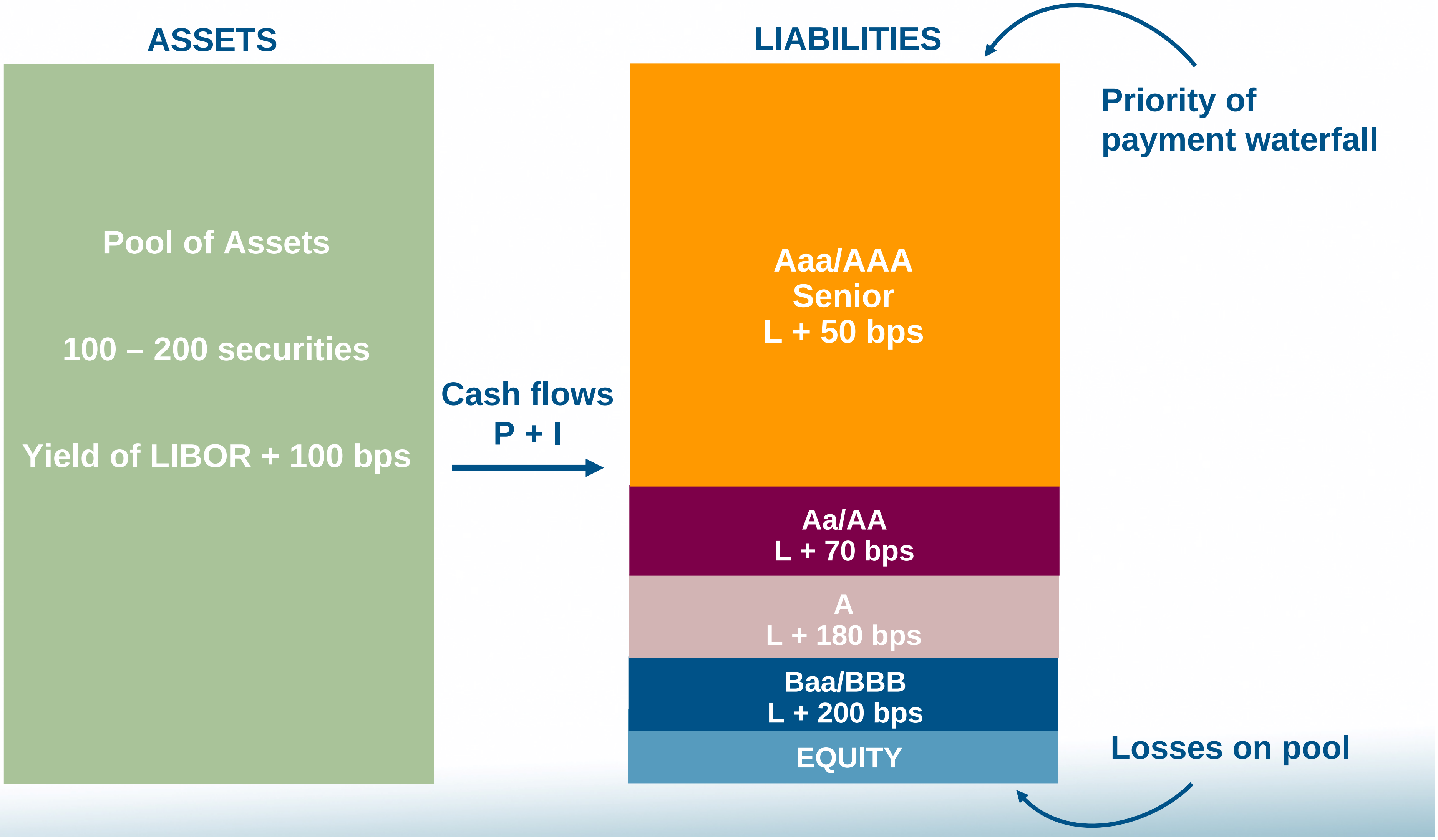
Collateralized Debt Obligations (CDO)

What is a CDO?

Collateralized debt obligation (CDO)

- ► A structured finance innovation
- ► Special purpose vehicle (SPV) issues notes and preferred shares to purchase a pool of assets
- ► CDO liabilities are backed by a diversified pool of assets
  - •CMBS
  - • ABS
  - • CDS
  - • High yield bonds
  - • Bank loans (CLO)
  - • Trust preferreds
  - • Corporate bonds
- ► Risks redistributed through a “tranching” of the structure

CDO Structure



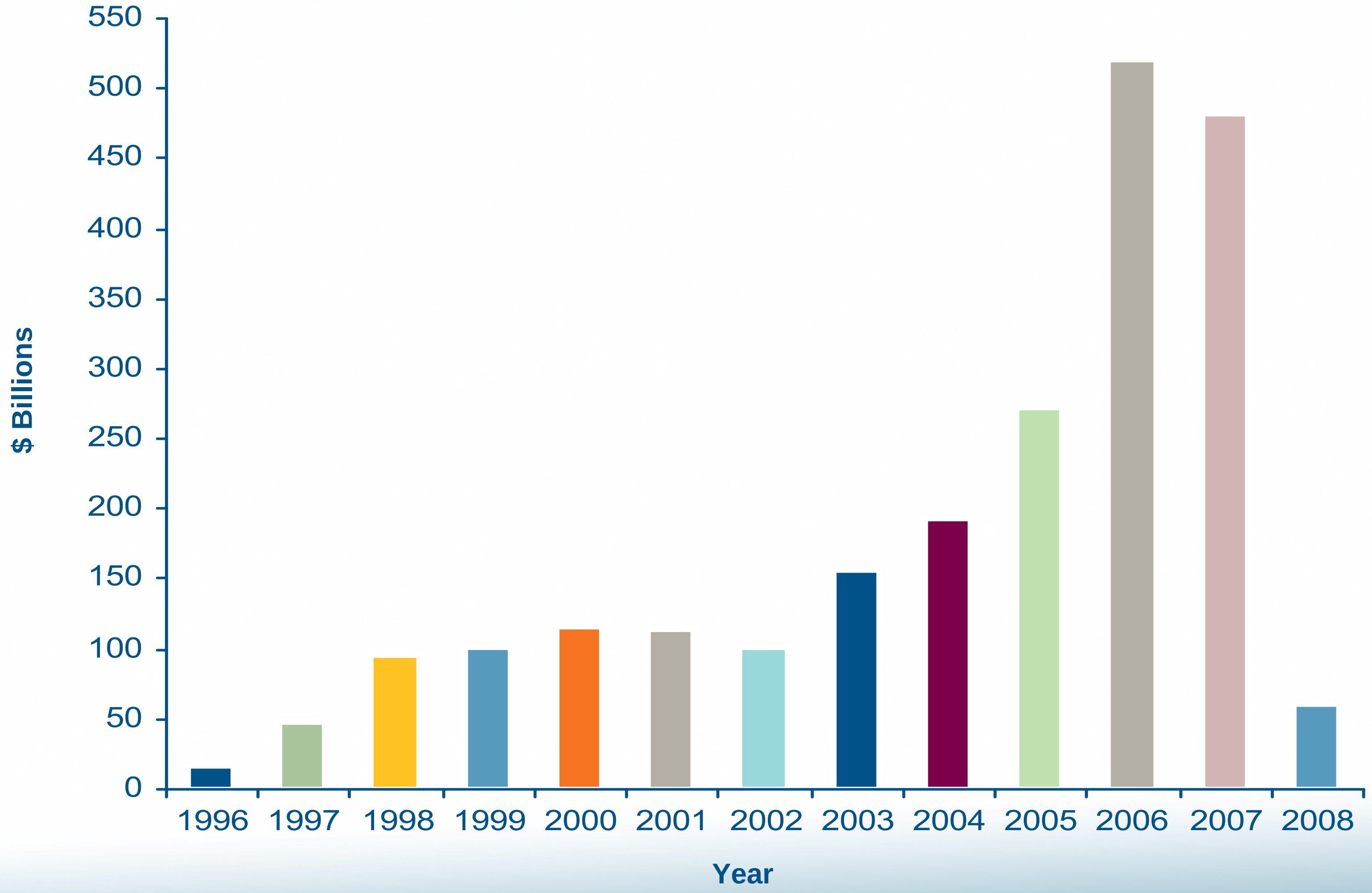
The CDO Sales Pitch

- Low/negative correlation to equity and fixed income investments
- Diversified exposure to assets that may otherwise be difficult to access
- Alternative to other fixed income investments
- Provides for third party asset management expertise
- Transparency of reporting/holdings
- Potential to generate attractive returns relative to other securities
- For CDO equity, receive non-recourse leverage to generate 13-25% returns
  - Cash flow distribution starts soon after investment

CDO Economics

Yield	L + 200 bps
Minus:	
Admin fees	5 bps
Management fee	15 bps
Cost of debt	70 bps
Net cash flow to equity:	110 bps
Loss estimates on assets:	25 bps
Excess to equity:	85 bps
Leverage factor (5% equity):	20x
Potential equity return:	17%

Global CDO Issuance History ($ billions)



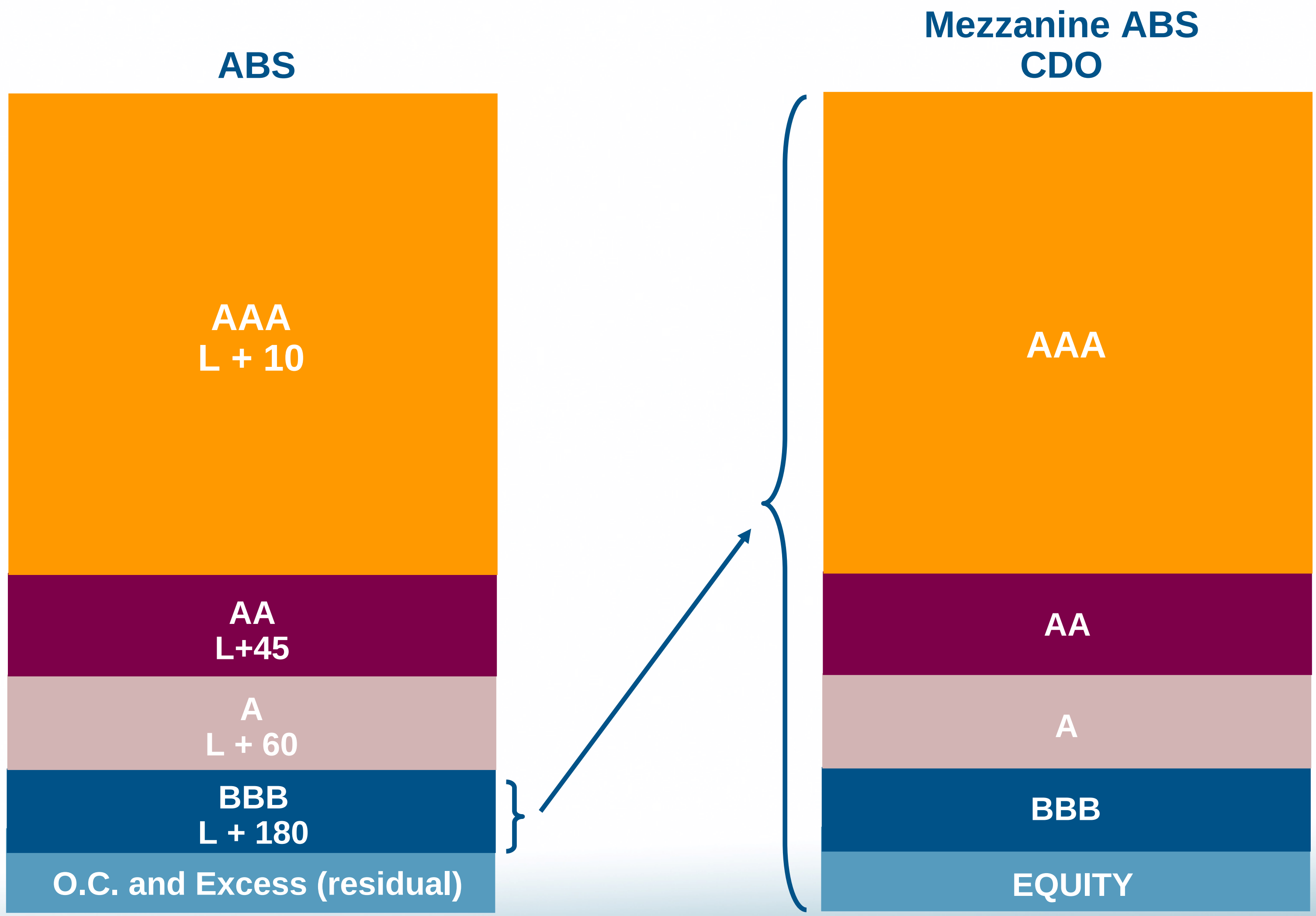
Securitization Technology

- Used power of capital markets to make credit readily available

- Investor motivation: Source of AAA rated securities
  - Higher yields (30 – 35 bps more yield)
  - Diversification of underlying assets
  - However, less liquid (lack of trading creates valuation issues later on)

- Agency ratings
  - Econometric models used in determining ratings on structure
    - Probability of default
    - Recovery on asset in case of default
    - Correlation between assets
  - Short history from which to make estimates and draw conclusions
  - Underwriters paid for ratings; worked closely with agencies on structures

Financial Innovation: Gets Out of Hand



Who were the investors?

- Debt classes – AAA through B-pieces
  - Banks
  - Insurance companies
  - Hedge funds
  - Conduits

- Equity tranches
  - Insurance companies
  - Hedge funds
  - Institutional investors

Credit Default Swaps (CDS)

What is a credit default swap?

- Derivative contract – allows for exchange of credit risk from one counterparty to another
- Insurance policy on a “reference entity” (corporate bond issuer)
- Over-the-counter instrument - swap allows for exchange of one cash flow for another over a specified period of time
- Other types of swaps include:
  - Interest rate swaps (fixed to floating rate)
  - Currency swaps (one currency for another)
  - Total return swaps (coupon + capital gain/loss on index vs. fixed or variable rate)
  - Credit default swaps (credit risk on an issuer)

CDS Mechanics

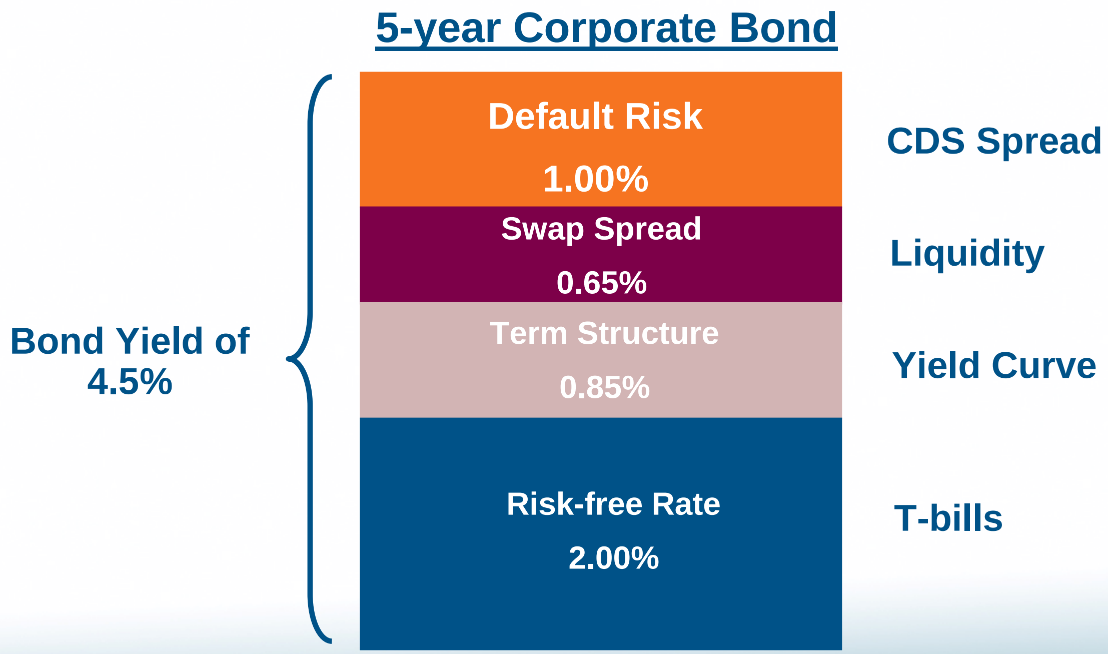
Buyer of Protection		Seller of Protection
"Short" Credit	Premium x Notional → 100 bps x $10 Million= $100K (or $25 per Qtr)	"Long" Credit

- Profits when credit deteriorates
- Pays a fee periodically over life of contract
- "Negative Carry" transaction

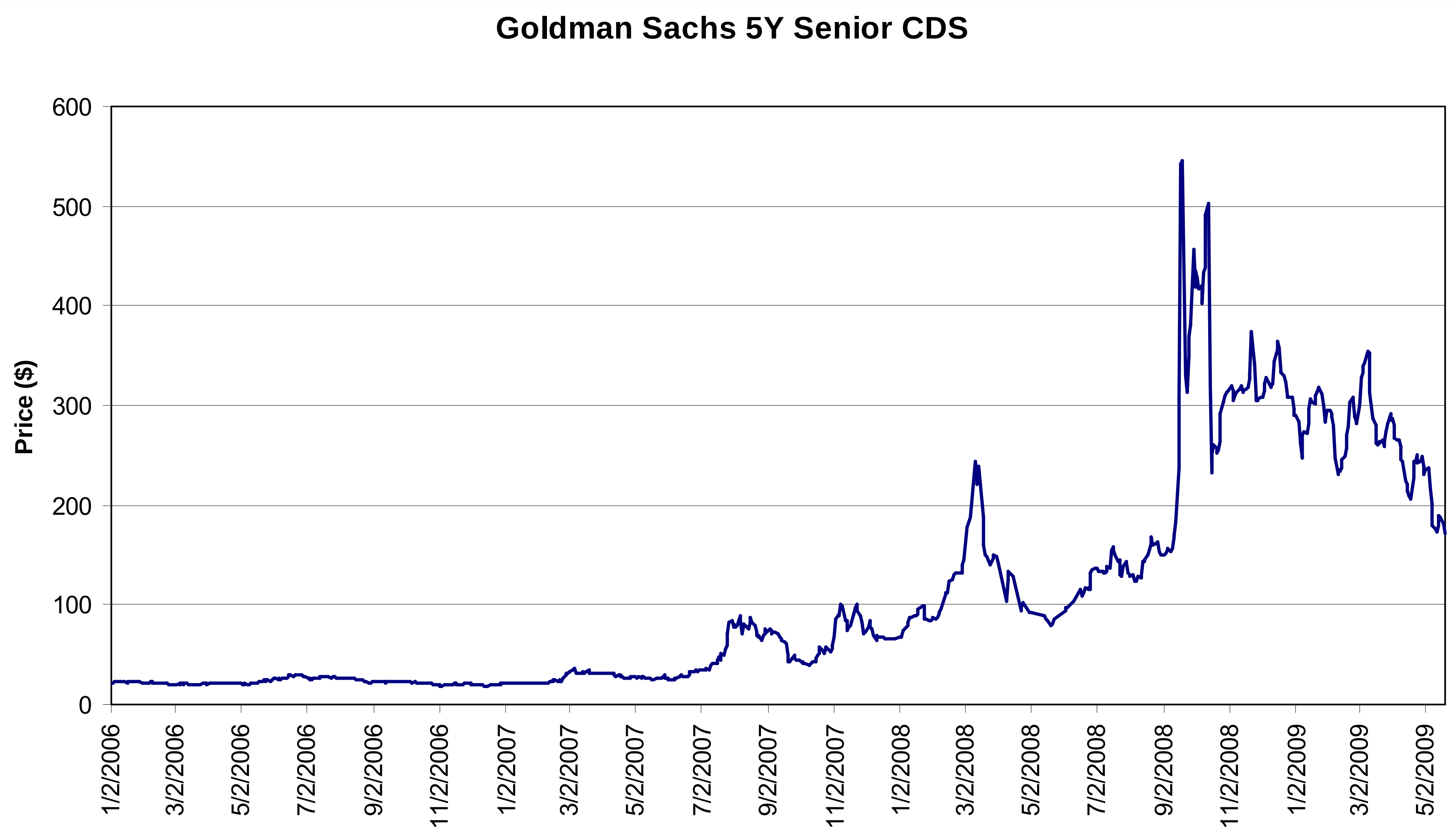
- Profits when credit is stable or improving
- Receives a fee periodically
- "Positive carry" transaction
- Commits to reimburse buyer for losses if a specified credit event occurs (i.e., default, bankruptcy, debt restructure)

Benefits/Uses of CDS

- Isolates only credit risk
- Traditional cash bonds would also include interest rate risk, prepayment (call) risk and liquidity risk
- Can use CDS to hedge or gain exposure; can also create "synthetic" versions of corporate bond by combining it with a Treasury bond purchase



CDS Example



Goldman Sachs 5Y Senior CDS
Price ($)
600
500
400
300
200
100
0
1/2/2006
3/2/2006
5/2/2006
7/2/2006
9/2/2006
11/2/2006
1/2/2007
3/2/2007
5/2/2007
7/2/2007
9/2/2007
11/2/2007
1/2/2008
3/2/2008
5/2/2008
7/2/2008
9/2/2008
11/2/2008
1/2/2009
3/2/2009
5/2/2009

Settlement

- Event of default (failure to pay)
- Bankruptcy
- Debt restructuring

<u>CASH SETTLEMENT</u>

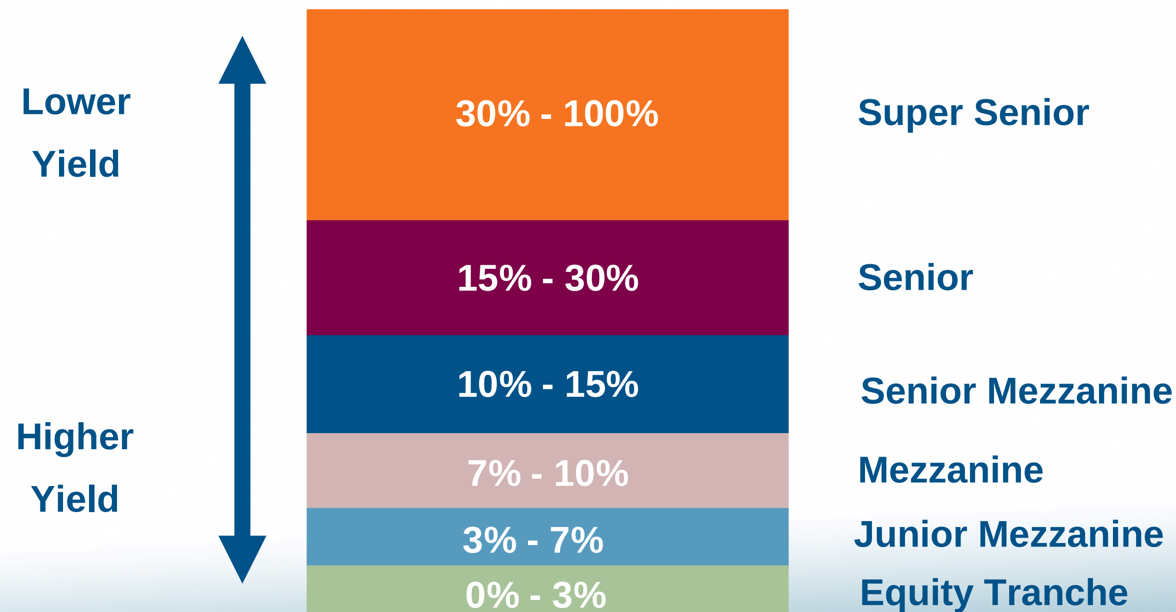
- Seller pays notional minus market value
- Market value determined through auction

<u>PHYSICAL SETTLEMENT</u>

- Buyer receives cash (notional)
- Buyer delivers defaulted bond to seller

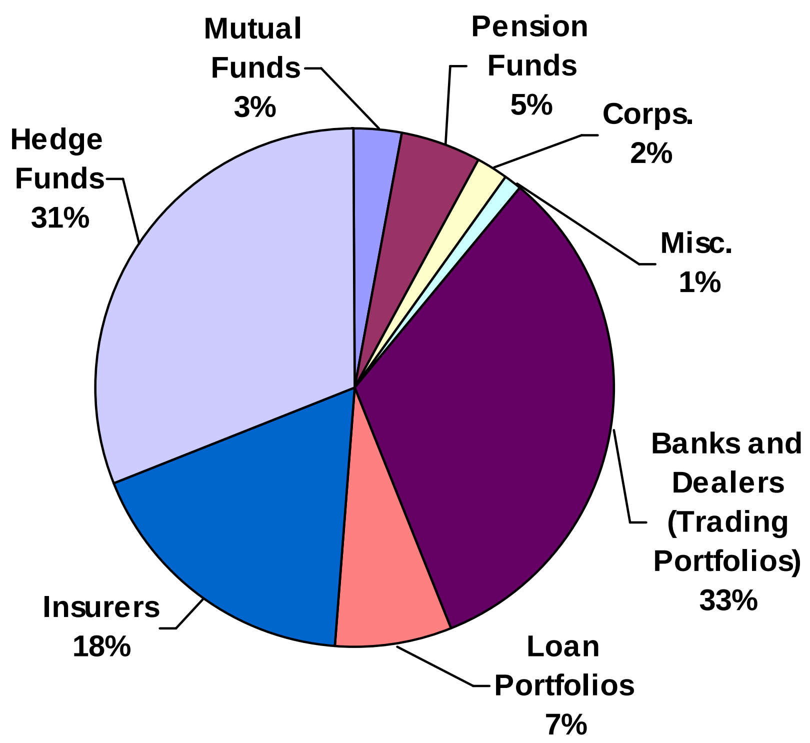
Types of credit default swaps

- Individual issuers (CDS, CDS of ABS, LCDS)
- Index baskets (CDX or itraxx) – allows investor to express a view on market or sector
  - Investment grade credit (CDX.NA.IG Index – 125 equally weighted credit CDS)
  - High yield (CDX.NA.HY Index – 100 issuers)
  - Home equity ABS – aka subprime mortgages (ABX introduced in 2006 – 20 deals)
  - Commercial mortgage backed securities (CMBX – 25 deals)
- Index baskets can be tranched similar to CDOs/synthetic CDOs

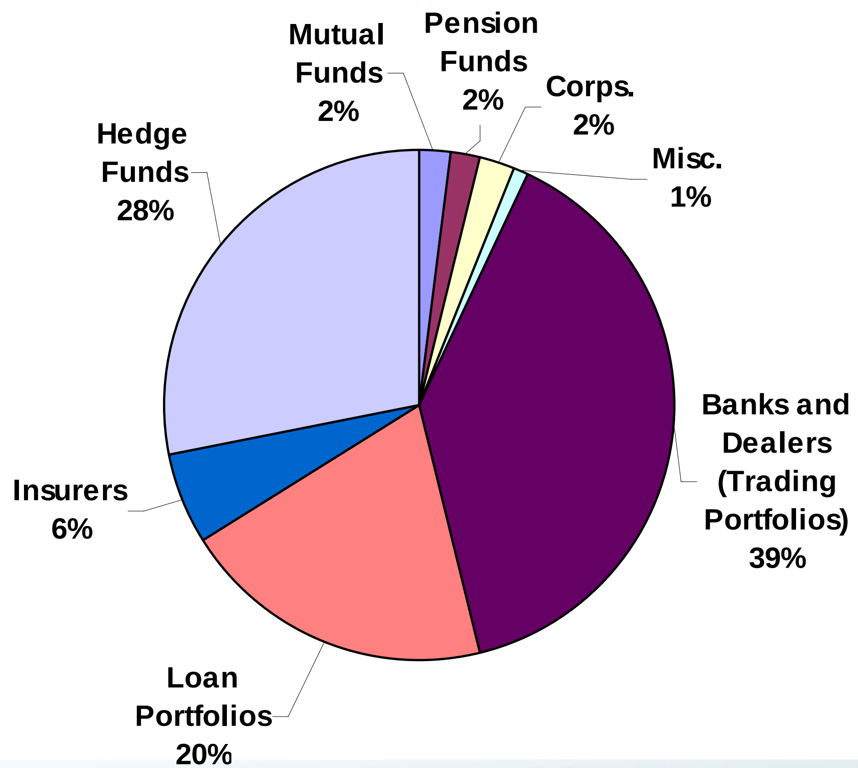


CDS Investors/Market Participants

Sellers of Protection



Buyers of Protection



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The Aftermath

How do you spell bailout?

- TLGP – Temporary Liquidity Guarantee Program
- TARP – Troubled Asset Relief Program
- FSP – Financial Stability Plan
- EESA Emergency Economic Stabilization Act of 2008
- ARRA – American Recovery and Reinvestment Act of 2009
- PPIP – Public-Private Investment Program (Legacy securities and Legacy loans)
- TALF – Term Asset Backed Securities Loan Facility
- TSLF – Term Securities Lending Facility
- PDCF – Primary Dealer Credit Facility

About the Presenter

MaryAnn DiMaggio, Director of Global Fixed Income Research

MaryAnn joined Evaluation Associates in 2001 and brings extensive fixed income and credit markets experience to the firm. Prior to joining Evaluation Associates, she spent five years in middle market lending and asset securitization at Franchise Mortgage Acceptance Company and Lehman Brothers. Prior to that, she was a high-yield securities analyst focusing on distressed debt and special situations research at Oppenheimer & Co. From 1987 to 1995, MaryAnn was with J.P. Morgan & Co. where she completed the management training program, spent three years as an internal audit officer, and later served in high-yield securities sales and trading. MaryAnn earned her MBA in Economics and BBA in Finance from Bernard M. Baruch College, City University of New York. She also holds a Series 65 License.

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