Securitization 101: An Introduction to Securitization

Mark Adelson

Executive Managing Director, Senior Research Fellow
Standard & Poor's
Agenda Overview

► History
► What is Securitization
► Mortgages and MBS
► Prepayments
► Credit
► Legal Structure
► Non-mortgage ABS
► CDOs
► Investment considerations
► Recent Performance Challenges
Finance & Securitization
History
Finance & Securitization History

► 600 BCE: coins
► 9th Century China: paper money
► 1661 Stockholm: fractional reserve banking
► 17th Century Europe: limited liability corp.
► 1666: Great Fire of London
► 1688: Lloyds Coffee House
► 1694: Bank of England
Finance & Securitization History (2)

► 1776: Adam Smith’s “Wealth of Nations”
► 1884: Comprehensive banking law in England
► 1914: World War I
► 1929: Great Depression begins
► 1934: Federal Housing Administration
► 1938: Federal National Mortgage Association (FNMA)
1948: FNMA purchases its first VA loan
1949: First secondary market transaction between two S&Ls
1954: FNMA converted to a private corp.
1957: Federal Home Loan Bank Board permits purchases and sales of mortgage loan participations
1968: Government National Mortgage Association (GNMA) is spun-off from FNMA

1970: GNMA guarantees first “pass-through” MBS backed by FHA/VA loans

1970: Federal Home Loan Mortgage Corporation (FHLMC)

1971: FHLMC introduces conventional mortgage pass-through
1971-1977: RMBS market develops; all deals from GNMA and FHLMC

1977: First private-label RMBS

1977-1984: limited private-label RMBS activity

1983: FHLMC issues first CMO

1983: FAS 77

1984: SMMEA law
Finance & Securitization History (6)

 ► 1985 March: First ABS, Sperry computer lease deal
 ► 1985 May: First auto loan ABS
 ► 1986: REMIC tax classification
 ► 1987 January: First credit card ABS
 ► 1988: Basel Capital Accord
 ► 1989: FIRREA creates OTS
Finance & Securitization History (7)

► 1996: FAS 125
► 2000: FAS 140
► 2001: Basel II proposal
► 2003: FIN 46, FIN 46(R)
► 2004: Regulation AB and Basel II
► 2009: Basel 2.5 and FAS 166 & 167
► 2011: Basel III
What is Securitization?
Financing a Business

- Equity vs. Debt
  - Principal and Interest

- A traditional corporate bond is an “IOU” or a promise to pay from a company.
  - A bond represents a company’s debt obligation

- There are many different types of bonds.
  - Corporate bonds
  - MBS, straight pass-throughs
  - ABS, CMBS, CMOs

$1,000 Bond
Basics of Consumer Finance

► Mortgage loans, auto loans, credit card loans, etc.
► Consumer finance companies make money in two ways
  ► Collecting interest on loans (the “net interest margin”)
  ► Selling loans at a profit
► Selling loans provides money for new loans
What Is Securitization?

- Securitization is a financing tool
- Similar to secured debt
- Securities backed by specific assets
- Cash flow from assets pays back securities
- Special cases
  - Risk transfer device
Mortgage Loans & MBS
U.S. Domestic Non-Financial Debt

Debt Outstanding as of 1/1/2012 ($ trillions)

- Federal Gov’t.: 10.45
- State & Local Gov’t.: 7.80
- Home Mortgage: 3.01
- Consumer Credit: 2.52
- Corporate: 10.29
- Other Business: 3.76

Total: $37.8 Trillion

Source: Federal Reserve, Flow of Funds Accounts of The United States, L.2 Credit Market Debt Owed by Nonfinancial Sectors
Why Focus on MBS

- Mortgages are a big slice of all U.S. debt
- MBS are a big slice of the bond market
- MBS are the biggest slice of the securitization market
- MBS is the original source of securitization technology
- Understanding MBS is helpful (often essential) to understanding other types of securitizations
U.S. Occupied Housing Units

as of 2010

112 million total units

Prime Mortgage 40%

Renters 34%

Free & Clear 21%

Sub-prime 5%

Source: Statistical Abstract of the U.S.
U.S. Capital Market Debt

Debt Outstanding as of 1/1/12

Outstandings ($ trillions)

Source: SIFMA, Federal Reserve
Note: Private-label RMBS includes mortgage-related ABS
Source: Inside Mortgage Finance
U.S. Non-Agency Securitization Issuance Volume

Note: Private-label RMBS includes mortgage-related ABS
Source: SIFMA
European Securitization Issuance Volume

Source: SIFMA
Mortgage Loan Basics

► Traditional loan is 30-year, fixed rate, fully amortizing, payable monthly, and prepayable at any time

► Variations
  ► 15-year, 20-year
  ► adjustable interest rate (ARMs)
    ► index
    ► caps
  ► hybrid (fixed/adjustable)

► Affordability features: interest only, negative am., 40-year

► Specialty mortgage products: alt-A, sub-prime
Refinancing: A Valuable Option

► Fixed rate loans
  ► When interest rates fall, a borrower can refinance his loan at a lower interest rate
  ► When interest rates rise, a borrower has the benefit of having locked-in a lower rate in the past

► Floating rate loans
  ► When hybrid loan resets borrower can refinance to new hybrid or to fixed
  ► When interest rates fall, a borrower has the ability to "permanently" lock-in the benefit of the low rates by refinancing into a fixed rate loan
Mortgage Loan = A Bond minus an Option

- Bond portion: obligation to pay principal and interest in monthly installments
- Option portion: opportunity to "call" (purchase) the bond at a price of par, at any time
- Lender is long the bond and short the option
- Borrower is short the bond and long the option
- Jargon: Mortgage loan contains an embedded short option
- Value of a mortgage loan is the value of the bond minus the value of the option
- Valuing the option is hard to do
Positive vs. Negative Convexity

Price vs. Yield chart showing:
- 5 Yr. Bond
- 10 Yr. Bond
- 30 Yr. Bond
- MBS

Yield ranges from 2.00% to 10.00%
Price ranges from 1,700 to 700
MBS Basic Features (GSE MBS)

► Pass-through security
  ► Monthly collections of interest and principal, including prepayments, "passed through" to investors
  ► Servicer collects payments from borrowers (for a fee)
  ► GSE guarantee protects investors from credit risk on loans

► Pass-through rate is like an interest rate on the MBS
  ► Lower than the interest rates on the loans
  ► Difference is the servicing fee plus the guarantee fee

► Loans backing an MBS are generally similar
  ► Interest rates
  ► Loan maturities
Basic MBS Cash Flow

► Homeowners make monthly payments of principal and interest at the mortgage rate.

► The servicer retains a portion of the interest component of each monthly payment as the "servicing fee."

► The pass-through rate is the mortgage rate net of the servicing fee rate.

![Diagram showing cash flow between Homeowners, Servicer, and Investors]

Homeowners

$ Monthly P&I at the mortgage rate (e.g. 6.5%)

Servicer

$ Monthly P&I at the pass-through rate (e.g. 6.0%)

Investors
Ginnie Mae – GNMA

- Guarantees securities issued by banks and mortgage banks that participate in Ginnie Mae programs
- Part of HUD
- Loans have federal insurance or guarantees (e.g. FHA or VA; usually low- or moderate income borrowers)
- Full faith and credit guarantee
- GN I: All loans have same interest rate
- GN II: Loan rates in 0.75% band
- Competes with sub-prime mortgage ABS for loans
Fannie Mae (FNMA) & Freddie Mac (FHLMC)

- Private corporations, federally chartered & regulated
- Directly issue MBS
- Accept conventional mortgage loans up to “conforming limit”
- Cash and swap programs for lenders
- Regular and special servicing
- with and without recourse; most sellers choose without
- Guarantees its own MBS against credit losses on the underlying loans
- Guarantee was not officially backed by the government before the financial crisis
- Loan Interest rates usually in 1.75% band
Private-Label MBS

- Issued by private companies
- No GSE guarantee
- Rated securities w/ credit support
  - Subordinate tranches absorb losses before senior tranches
  - Mortgage loan credit quality:
    - Collateral – loan-to-value ratio (LTV)
    - Credit – credit score (FICO)
    - Capacity – debt-to-income ratio (DTI)
- Jumbo: loans above conforming limit
- Alt-A: loans that contain non-standard features but which have borrowers of "A" creditworthiness
- Securities backed by sub-prime mortgage loans are classified as "home equity ABS" rather than MBS
MBS Trading

- TBA (to be announced) pools traded generically
- Coupon stack
- Cheapest to deliver strategy
- Specified pools – investor knows exactly what he will get but he must pay more and can pick only from what is available
- Bloomberg℠ system provides much information
- The whole GSE MBS market settles trades according to a fixed monthly cycle
MBS Valuation

- Dynamic analysis
- Prepayment models and assumptions
- Interest rate simulations
- Option adjusted spread (OAS) analysis:
  - Applies a fixed spread over benchmark interest rates to calculate a simulated price for the security under each scenario, as well as the average of the simulated prices across all scenarios
  - Adjusts the fixed spread and repeats the calculation process until the average of the simulated prices across all scenarios converges to the actual market price
  - Reported OAS is the fixed spread that equates the average of the simulated prices to the actual market price of the security
- MBS values falls when interest rates are more volatile
- Private label also must consider credit risk
A Closer Look at Prepayments and MBS Structures
Key Theme: Prepayments

- Prepayment risk distinguishes MBS
- Comes from prepayment option in residential mortgage loans
- Gives MBS undesirable "negative convexity"
- Gives MBS higher yields than securities without prepayment risk

Source: Bloomberg MTGEGNSF, GT5
Basic Cash Flows, 30 Year, 7% Mortgage Loan

No Prepayments

Time →

Money

Interest

Principal
Structure: Prepayments (2)

Principal Cash Flows, 30 Year, 7% Mortgage Loan

No Prepayments

Money

Time →

Principal
Structure: Prepayments (3)

Principal Cash Flows, 30 Year, 7% Mortgage Loan

- 6% CPR
- 3% CPR
- 12% CPR
- 24% CPR
Structure: Prepayments (4)

Principal Cash Flows, 30 Year, 7% Mortgage Loan

100% PSA

50% PSA

200% PSA

400% PSA

Money →

Time →
Interest Cash Flows, 30 Year, 7% Mortgage Loan

No Prepayments

Money

Time →

Interest
Structure: Prepayments (6)

Interest Cash Flows, 30 Year, 7% Mortgage Loan

100% PSA

50% PSA

200% PSA

400% PSA
Structure: Prepayments (7)

Slicing Principal Cash Flows over Time: Building a CMO

- 165% PSA
- 350% PSA
- 165% PSA
- 75% PSA

Money → Time →
Structure: Prepayments (8)

Shifting Prepayment Risk: Building PAC Classes in a CMO

- PAC Cash Flow
  - 75% PSA
  - 350% PSA

- 165% PSA
  - PAC A, PAC C, PAC E, PAC F, Companions

- 350% PSA

- 75% PSA

Money →

Time →
Structure: Prepayments (9)

Shifting Prepayment Risk: Sensitivity of Companion Classes

165% PSA
- Companions
- PACs

350% PSA

75% PSA
The Credit Dimension
What is “Credit Quality?”

► Is a bond safe or risky?
► How likely is it that a bond will default (fail to make a required payment)?
► In the event of a default, will an investor’s loss be large or small?
► A rating expresses a view about the credit quality of a bond.
Reallocating Credit Risk – Tranching

Pool of Loans

Underlying Assets

Securities

Highest Risk

Class D - "BBB"

Class C - "A"

Class B - "AA"

Class A - "AAA"

Residual - NR

First Loss Allocation

Last
More on Credit Enhancement

► Subordination
  ► Six pack structure (jumbo and "true" alt-A)
    ► Prepayment lockout: seven years or $2 \times$ subordination, phase-out, triggers
  ► Excess spread/OC structure (sub-prime and weak alt-A)
    ► Use ES to cover current losses and build OC (turbo)
    ► Surplus ES to residual class
    ► Principal lockout w/ triggers (3 years or $2 \times$)

► Fast pay, no pay

► Reserve Fund

► Bond Insurance, guarantees
Sub-prime MBS Cashflow Example

- Senior-sub, O/C (not like prime MBS six pack)
- Sequential / pro-rata / reverse sequential, with triggers
Rating Arbitrage in a Frequency-Only Rating System

- None: 15%
- Sr/Sub #1: 10% ★★★
- Sr/Sub #2: 10% ★★
- Sr/Mez/Sub: 15% ★★★
Tradeoff of Frequency and Severity in an Expected Loss Rating System

- Expected Frequency of Default
- Expected Severity of Default
- Aaa/AAA
- Aa1/AA+
- Aa2/AA
- Aa3/AA-
- A1/A+
- A2/A
- A3/A-
Legal Structure
and Parties
Securitization Diagram

Consumers (obligors) → "Issuer" (sponsor) → Investors

- Consumers make payments to "Issuer".
- "Issuer" transfers payments minus fees to Trustee.
- Trustee transfers proceeds from sale of securities to SPE (Issuer).
- SPE issues securities and transfers proceeds from sale of securities to Investors.
- Credit Support is provided if needed.

Proceeds from sale of securities → Transfer of assets → Proceeds from sale of securities

Securitization and SPEs

- Securitization uses SPEs to hold assets.
- SPEs help separate asset risk from company risk.
  - Securitization investors accept asset risk but want to avoid company risk
- When a company sells assets in a securitization, ownership goes to an SPE.
Status of securitized assets remains slightly uncertain

Securitizations use SPEs partly to address bankruptcy concerns

Appropriate amendments to the bankruptcy code could reduce uncertainty
Determining whether a securitization results in removing securitized assets from a company's balance sheet generally depends on economic substance rather than the mere form of the transaction.

- A securitization may fail to remove securitized assets from a company's balance sheet if the company retains substantial risks or benefits associated with the future performance of the assets.

- If the company retains no risks or benefits associated with the asset's future performance – either directly or indirectly through an SPE or otherwise – then the transaction should be treated as a sale and the assets should not appear on the company's balance sheet.
Other Players

- Investment Bankers
- Lawyers
- Accountants
- Rating Agencies
Securitization Benefits

► Housing
  ► Lower mortgage rates
  ► Higher mortgage loan availability
  ► Elimination of regional funding shortages
  ► Equalization of mortgage rates nationwide
  ► Standardization of the application process
  ► Faster decisions for applicants
  ► Higher rate of home ownership
  ► Home equity loans
  ► Home equity lines of credit
Securitization Benefits (2)

► Consumer Finance
  ▶ Greater availability for “subprime” consumers

► Commercial Real Estate
  ▶ Capital market participation in commercial real estate finance dampens the volatility of the real estate cycle, making booms and busts less extreme.

► Commercial Finance
  ▶ Equipment lease securitizations make equipment available more cheaply to users of equipment
  ▶ Examples include: computers, aircraft, shipping containers, medical equipment, railroad cars, office machines, and trucks
What Drives Securitization Benefits?

- **Asset-liability matching**: Asset cash flows go directly to securities issued

- **Lower funding costs**: Securities pay lower yields than companies could achieve with traditional borrowings

- **Improved liquidity**: Reduces a company’s dependency on traditional sources of borrowing to finance its assets
“Mis-use” of Securitization

► Example of proper use: A transaction to achieve lower funding costs, improved liquidity, or asset-liability matching

► Example of “mis-used” securitization: A transaction to achieve accounting results, but which lacks economic substance

► Accounting for securitizations should reflect real economic substance rather than the mere form
“Mis-use” of Securitization (2)

► Shrinking balance sheets: Companies can “sell” assets while retaining risks and benefits of ownership
► Bank capital regulation: Banks lower capital requirements without reducing risks
► Gain-on-sale accounting: Companies book false earnings based on flawed projections
Accounting Distortions

► Purpose of financial statements is to fairly reflect the economic condition of a company

► “Mis-use” of securitization can distort a company’s financial statements and thwart the purpose of having financial statements
Banks & Securitization

- U.S. banks have been major securitization issuers
- Disintermediation
  - Banks manage primarily for return on equity (ROE)
  - Reducing total assets is often helps to improve ROE
  - Shift away from holding assets and toward originating and servicing assets sold to others
- Technology
  - Helps facilitate analysis and sale of assets
  - Helps structure cash flows in securities (“slicing and dicing”)
Non-mortgage Securitization
Types of Securitization Structures?

- Amortizing
  - RMBS, CMBS, Auto loan ABS
- Non-amortizing or revolving
  - Credit Card ABS
Credit Card ABS

► Generally the tightest spreads
► Soft bullet maturities (wide range)
  ► Rated final (legal) maturity
  ► Unrated early amortization risk
  ► Company risk
  ► Very low average life volatility
► Monthly interest distributions
► Performance measures: charge-off rate, payment rate, yield
  ► Stable vs. declining pool assumption
► Master trust structures (good liquidity)
Prime Auto Loan/Lease ABS

- Next tightest spreads after credit cards
- Amortizing principal, monthly cash flows
  - Monthly reinvestment of principal
- Short maturities
- Modest prepayments
  - Modest average life volatility
- Individual liquidating pools
Real Estate ABS (HEL/B&C and MH)

- Much wider spreads than credit cards and autos
- Amortizing principal, monthly cash flows
  - Monthly principal reinvestment
- Wide range of maturities
- Medium optionality
  - Significant sensitivity to prepayments and significant negative convexity
- Performance measures: prepayments, losses, delinquencies
- Credit volatility
- Individual, liquidating pools
- Company/servicing/headline risk
Sampling of “Other” Asset Classes

- equipment leases (aircraft, medical, computers)
- student loans
- alternative student loans
- corporate bonds and loans
- utility stranded costs
- franchisee loans
- "future" receivables (e.g., Mexican exports)
- structured settlements
- net interest margin
- high LTV mortgage loans
- health care receivables
- trade receivables
- entertainment royalties
- delinquent tax liens
- "catastrophe" risk
- mutual fund fees
## Summary (so far)

<table>
<thead>
<tr>
<th>Risk</th>
<th>Cards</th>
<th>Autos</th>
<th>RE-ABS</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturity range</td>
<td>wide</td>
<td>short</td>
<td>wide</td>
<td>varies</td>
</tr>
<tr>
<td>Credit risk</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>varies</td>
</tr>
<tr>
<td>Credit risk volatility</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>high</td>
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<tr>
<td>Average life volatility</td>
<td>low</td>
<td>low</td>
<td>medium</td>
<td>varies</td>
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<tr>
<td>Negative convexity</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>varies</td>
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<td>Liquidity</td>
<td>high</td>
<td>medium</td>
<td>medium</td>
<td>low</td>
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<td>Company risk</td>
<td>low</td>
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<td>high</td>
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<tr>
<td>Monthly interest</td>
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<td>yes</td>
<td>yes</td>
<td>varies</td>
</tr>
<tr>
<td>Monthly principal</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>varies</td>
</tr>
</tbody>
</table>
Mortgage Pass-Throughs (MBS)

- Relatively wide spreads
- 30-Year or 15-year final maturities
  - Rated final (legal) maturity
  - High average life volatility
  - Unrated prepayment risk
- Monthly principal and interest distributions
- Good liquidity on agency issues
- Credit risk
  - None on agency issues
  - Varying degrees on private-label MBS
CMOs

- Complicated structures
- Average-life volatility and negative convexity vary among types of tranches
- Less liquid than agency MBS
- Higher liquidity for tranches with more predictable cash flow
- PAC spreads tighter and companion spreads wider than comparable MBS
CDOs/CLOs/CBOs
Collateralized Debt Obligations
Collateralized Loan Obligations
Collateralized Bond Obligations
Basic CDO Structure – Tranching

Underlying Assets

Securities

Bonds

AAA

AA

A

BBB

Equity

First Loss Allocation

Last

Highest Risk

Lowest Risk

Super Sr.
CDO Structure – Additional Features

► CDO lifecycle
  ▶ Ramp-up phase
  ▶ Revolving phase
  ▶ Amortization phase

► Waterfall
  ▶ Pre-2005: mostly sequential
  ▶ Post-2005: mostly pro rata (sometimes with toggle)

► Collateral quality tests (eligibility)

► Performance tests
  ▶ Overcollateralization (OC) – par haircuts
  ▶ Interest coverage (IC)

► Events of Default
Vocabulary for CDOs of ABS

Synonyms

► CDO of ABS
► ABS CDO
► structured finance CDO
► SF CDO
► Multi-sector CDO
Valuation – Monte Carlo Simulation

Key Variables
- Probability of default
- Recovery rate
- Correlation
- Price

Given a market price for a tranche and a specified correlation model, we can calculate the "implied" correlation of default risk among the reference assets.

Give an assumed level of correlation and a specified correlation model, we can calculate the theoretical price of a tranche.
CDO Pricing Challenges

► Estimating probabilities of default
  ▶ generally estimated from individual CDS spreads…
  ▶ …but the market is not always “right”
  ▶ dealers seek widest spreads in each rating category

► Oversimplifying correlation
  ▶ time-varying
  ▶ many interdependencies

► Estimating recoveries
Investment Considerations
Basic Components of Yield

- Time value of money: risk free rate
- Term structure: tenor, average life
- Credit risk premium
- Liquidity premium
- Optionality
- Taxability of interest
- Convenience
Time Value of Money

► Relevant for all bonds – not only ABS
► Risk free rate
► Pure time value
  ▶ Treasury bills and stripped bonds
► Coupon bonds have reinvestment risk
► Other benchmarks (swaps, LIBOR, etc.) are not close proxies for pure time value
Term Structure of Rates

► Relevant for all bonds – not only ABS
► More yield for longer terms (most of the time)
► Theories of term structure
  ► expectations (implied forward rates)
  ► liquidity
  ► preferred habitat
Credit Risk Premium

► Relevant to nearly all bonds
► Compensates investor for risk of default
  ► Likelihood of default
  ► Expected severity of default
► Ratings are one-dimensional opinions about credit risk
► Volatility of ratings
Liquidity Premium

- Relevant to many bonds
- Size of market
- Size of issue
- Public offering vs. private placement
- Visible in bid-ask spread
Optionality

- Relevant in callable and putable bonds
- Embedded options
  - Callable bonds contain an embedded short position in a call option
- Average life volatility
- Reinvestment risk
- Default option
- Negative convexity
Convenience

► Relevant to many bonds
► Frequency of cash flow
► Amortizing principal
► Structural simplicity/complexity
Recent Performance Challenges
# Adverse Credit Migrations of 2005-2007 Vintages of U.S. RMBS, CDOs of ABS, and SIV Lites

<table>
<thead>
<tr>
<th>Original S&amp;P Rating</th>
<th>Status as of 31 December 2010</th>
<th>No. of Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Default + Near Default</td>
<td>Default</td>
</tr>
<tr>
<td>AAA</td>
<td>60.1%</td>
<td>22.7%</td>
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<tr>
<td>AA</td>
<td>78.2%</td>
<td>45.8%</td>
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<tr>
<td>A</td>
<td>88.5%</td>
<td>59.7%</td>
</tr>
<tr>
<td>BBB</td>
<td>94.0%</td>
<td>69.4%</td>
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<tr>
<td>Inv. Grade</td>
<td>82.8%</td>
<td>52.8%</td>
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</tbody>
</table>

Note: 'AAA' ratings from the same transaction are treated as a single rating in this table's calculation. Multiple rating actions are aggregated to calculate a security's cumulative rating performance. Near default means rated 'CCC+' or lower.

## Impetus for Change – Financial Firms

<table>
<thead>
<tr>
<th>Company</th>
<th>S&amp;P ICR at 1/1/07</th>
<th>Δ Eq Px 2007-08</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIG</td>
<td>AA+</td>
<td>-97.7%</td>
<td>~$183b in bailouts. US govt owns 80% stake</td>
</tr>
<tr>
<td>Bear Stearns</td>
<td>AA-</td>
<td>-94.2%</td>
<td>Shotgun marriage with JP Morgan for $10/share</td>
</tr>
<tr>
<td>Citigroup</td>
<td>AA</td>
<td>-86.7%</td>
<td>Hybrids exchanged, U.S. gov’t took 36% equity</td>
</tr>
<tr>
<td>IndyMac</td>
<td>BBB</td>
<td>-99.6%</td>
<td>Seized by FDIC in 2008, auctioned off in March 2009</td>
</tr>
<tr>
<td>Lehman</td>
<td>AA-</td>
<td>-100.0%</td>
<td>Bankruptcy 9/15/2008.</td>
</tr>
<tr>
<td>Merrill Lynch</td>
<td>AA-</td>
<td>-18.1%</td>
<td>Bought out by B-of-A 9/14/2008</td>
</tr>
<tr>
<td>Northern Rock</td>
<td>A+</td>
<td>-92.4%</td>
<td>Nationalized 2/22/2008.</td>
</tr>
<tr>
<td>RBS</td>
<td>AA</td>
<td>-92.6%</td>
<td>Part nationalization, UK gov’t holds 84% stake</td>
</tr>
<tr>
<td>UBS</td>
<td>AA+</td>
<td>-76.3%</td>
<td>Write-downs &gt;$50B since 2007</td>
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<td>Wachovia</td>
<td>AA-</td>
<td>-89.3%</td>
<td>“Silent run&quot; in Sep 2008; acquired by Wells Fargo</td>
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<td>WaMu</td>
<td>A</td>
<td>-100.0%</td>
<td>Receivership 9/25/2008.</td>
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<tr>
<td>Fannie Mae</td>
<td>AA-</td>
<td>-98.6%</td>
<td>Conservatorship 9/7/2008. U.S. Treasury holds preferred stock and warrants worth 80% stake</td>
</tr>
<tr>
<td>Freddie Mac</td>
<td>AA-</td>
<td>-98.9%</td>
<td></td>
</tr>
</tbody>
</table>
### Impetus for Change – Financial Firms (2)

<table>
<thead>
<tr>
<th>Company</th>
<th>S&amp;P ICR at 1/1/07</th>
<th>Δ Eq Px 2007-08</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambac</td>
<td>AAA</td>
<td>-98.5%</td>
<td>Bankruptcy 11/8/2010</td>
</tr>
<tr>
<td>MBIA</td>
<td>AAA</td>
<td>-94.3%</td>
<td>Rated B, attempting restructuring</td>
</tr>
<tr>
<td>FGIC</td>
<td>AAA</td>
<td>n.a.</td>
<td>Bankruptcy 8/3/2010</td>
</tr>
<tr>
<td>FSA</td>
<td>AAA</td>
<td>n.a.</td>
<td>Acquired by AGC in July 2009</td>
</tr>
<tr>
<td>ACA</td>
<td>A</td>
<td>n.a.</td>
<td>Restructuring plan 8/8/2008</td>
</tr>
<tr>
<td>AGC</td>
<td>AAA</td>
<td>-56.4%</td>
<td>Now rated AA-</td>
</tr>
<tr>
<td>CIFG</td>
<td>AAA</td>
<td>n.a.</td>
<td>CC rating withdrawn 2/16/2010</td>
</tr>
</tbody>
</table>
Change: S&P Criteria Updates

► Substantive changes
  ► CMBS (26 Jun 2009)
  ► RMBS (10 Sep 2009)
  ► Corporate CDOs (17 Sep 2009)
  ► Covered Bonds (16 Dec 2009)
  ► Counterparty (6 Dec 2010, proposed update 21 Nov 2011)
  ► Bond insurers (25 Aug 2011)
  ► Banks (9 Nov 2011)

► Creating a rigorous and systematic process
  ► U.S. States (3 Jan 2011)
  ► Sovereigns (30 Jun 2011)

► Transparency emphasis in all of the above
Hierarchy of Issues and Concepts

- **Structure**
  - Losses
  - Delinquencies
  - Prepayments
  - Dilution
  - Payment rate
  - Yield

- **Triggers**
  - Governance
  - True sale
  - Tax
  - Accounting
  - Legal
  - Asset quality
  - Cash flow
  - Credit enhancement
  - Substantive consolidation
  - True sale
  - Security interest

- **Asset characteristics**
  - Willingness to pay (FICO)
  - Ability to pay (DTI, DSC)
  - Collateral (LTV, appraisal)
  - Losses
  - Delinquencies
  - Prepayments
  - Payment rate
  - Yield
  - Credit tranching

- **Legal**
  - Bankruptcy remoteness
  - Security interest
  - True sale
  - Substantive consolidation

- **Asset quality**
  - Governance
  - Credit enhancement
  - Triggers
  - Early amortization
  - Time tranching
  - Revolving/liquidating

- **Historical performance**
  - Capital regulation
  - Tax
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  - True sale
  - Collateral (LTV, appraisal)

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  - Servicing fees
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Mark Adelson is a capital markets executive with a broad background in credit analysis and fixed income markets. He is an executive managing director and senior research fellow at Standard & Poor's. He previously served as S&P's chief credit officer from May 2008 until December 2011. He focuses primarily on the relative intensity of credit risk across different sectors of the fixed-income landscape and on the interplay between credit ratings and fixed-income markets. He has extensive experience in securitization, with particular emphasis on mortgage-backed securities (MBS) and collateralized debt obligations (CDOs). Adelson is also a lawyer, admitted to practice in New York.

www.markadelson.com