Securitization 101: An Introduction to Securitization

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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)

Finance & Securitization History (3)

- 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

Finance & Securitization History (4)

- 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

Finance & Securitization History (5)

- 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

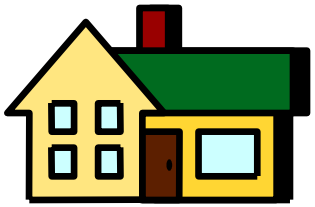
What is Securitization?

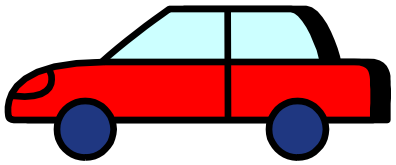
Financing a Business

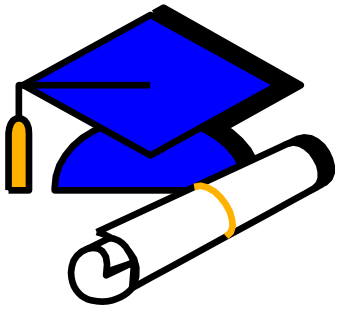
- Equity vs. Debt
  - Principal and Interest
- A traditional corporate bond is an "IOU" or a promise to pay from a company.
  - A bond represents a company's debt obligation
- There are many different types of bonds.
  - Corporate bonds
  - MBS, straight pass-throughs
  - ABS, CMBS, CMOs

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







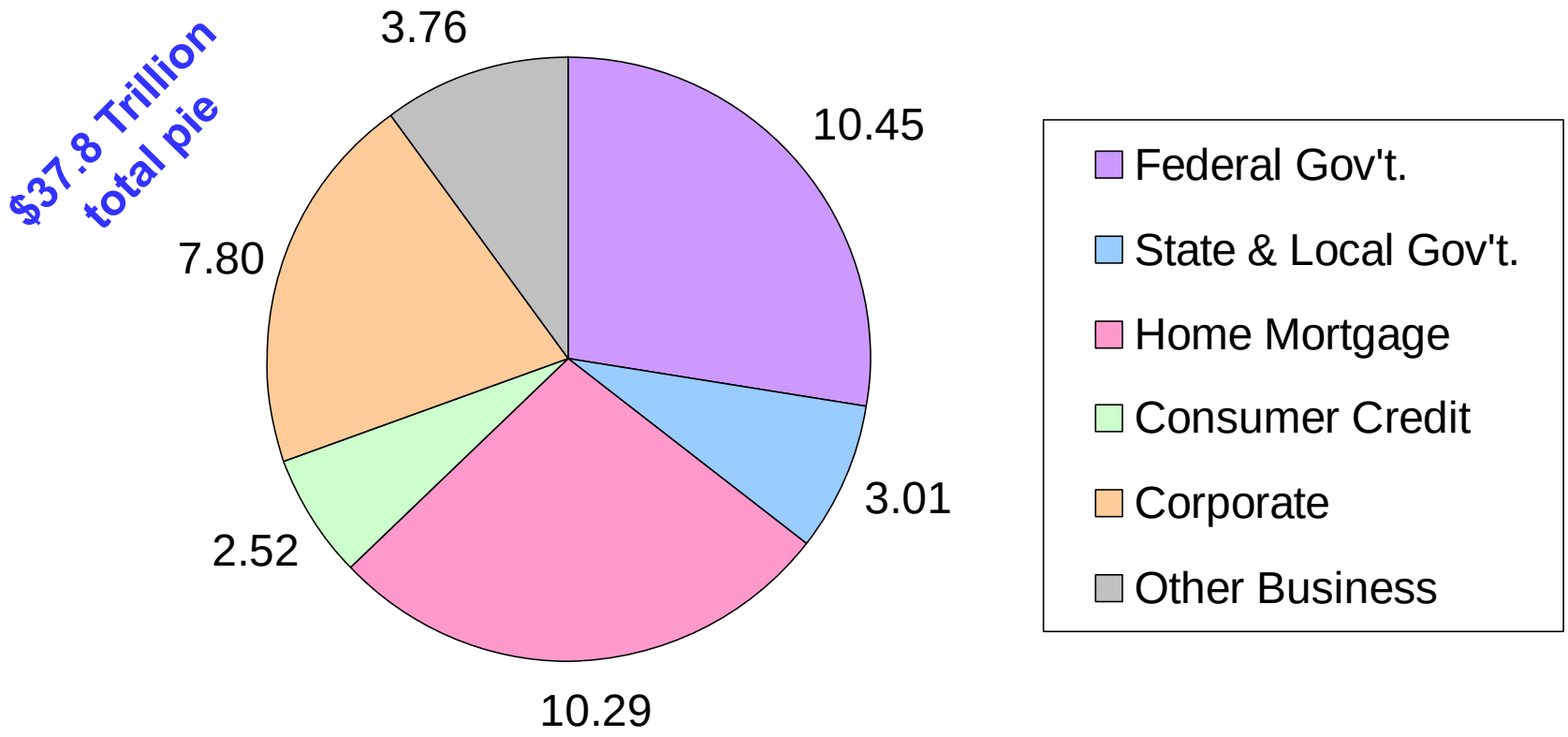
What Is Securitization?

- 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)



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

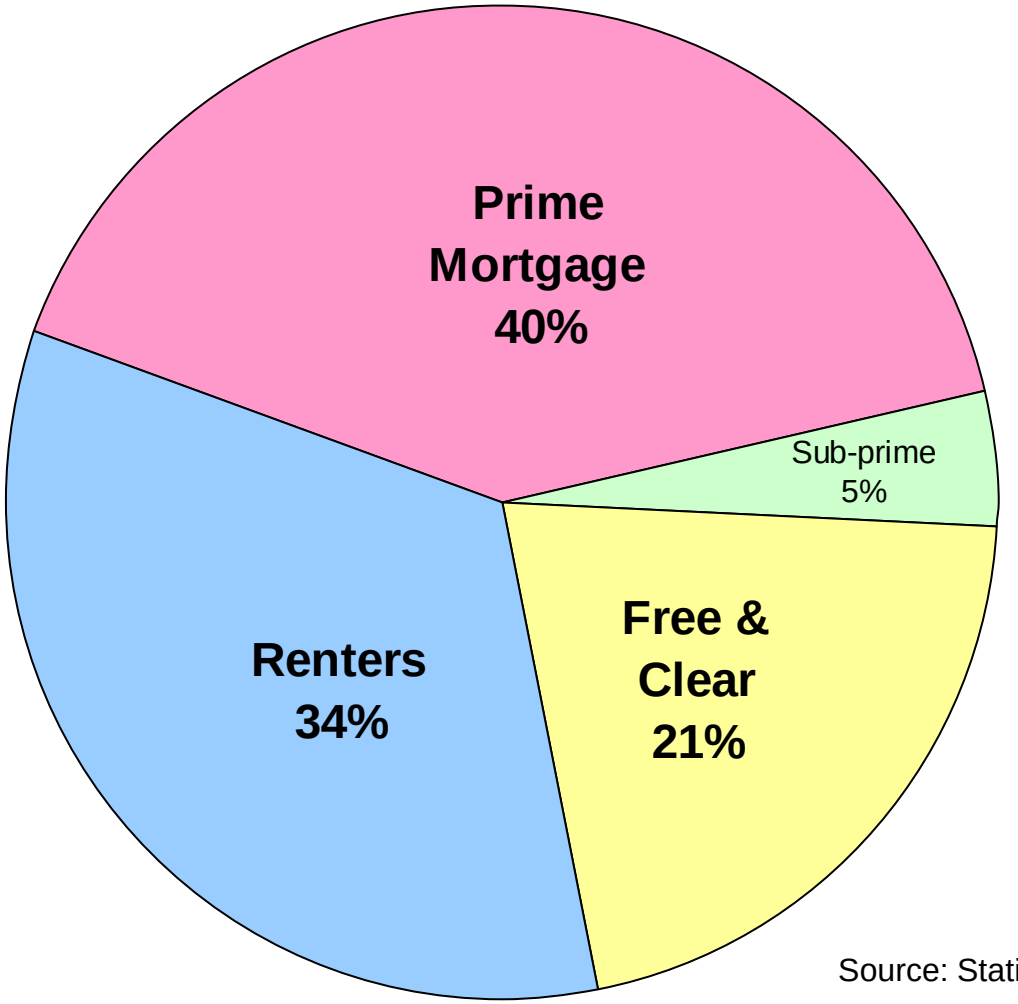
Why Focus on MBS

- 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

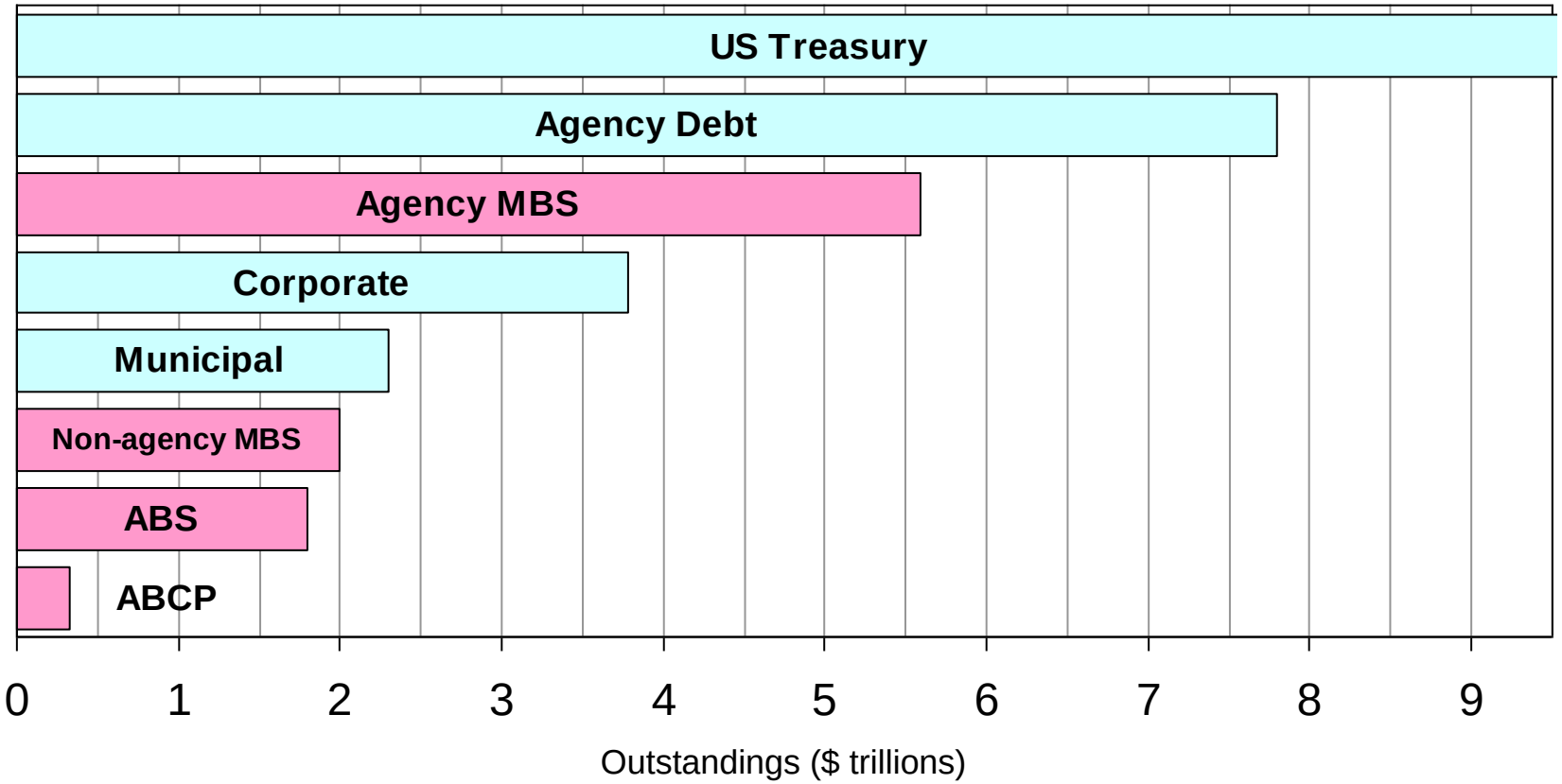
112 million total units



Source: Statistical Abstract of the U.S.

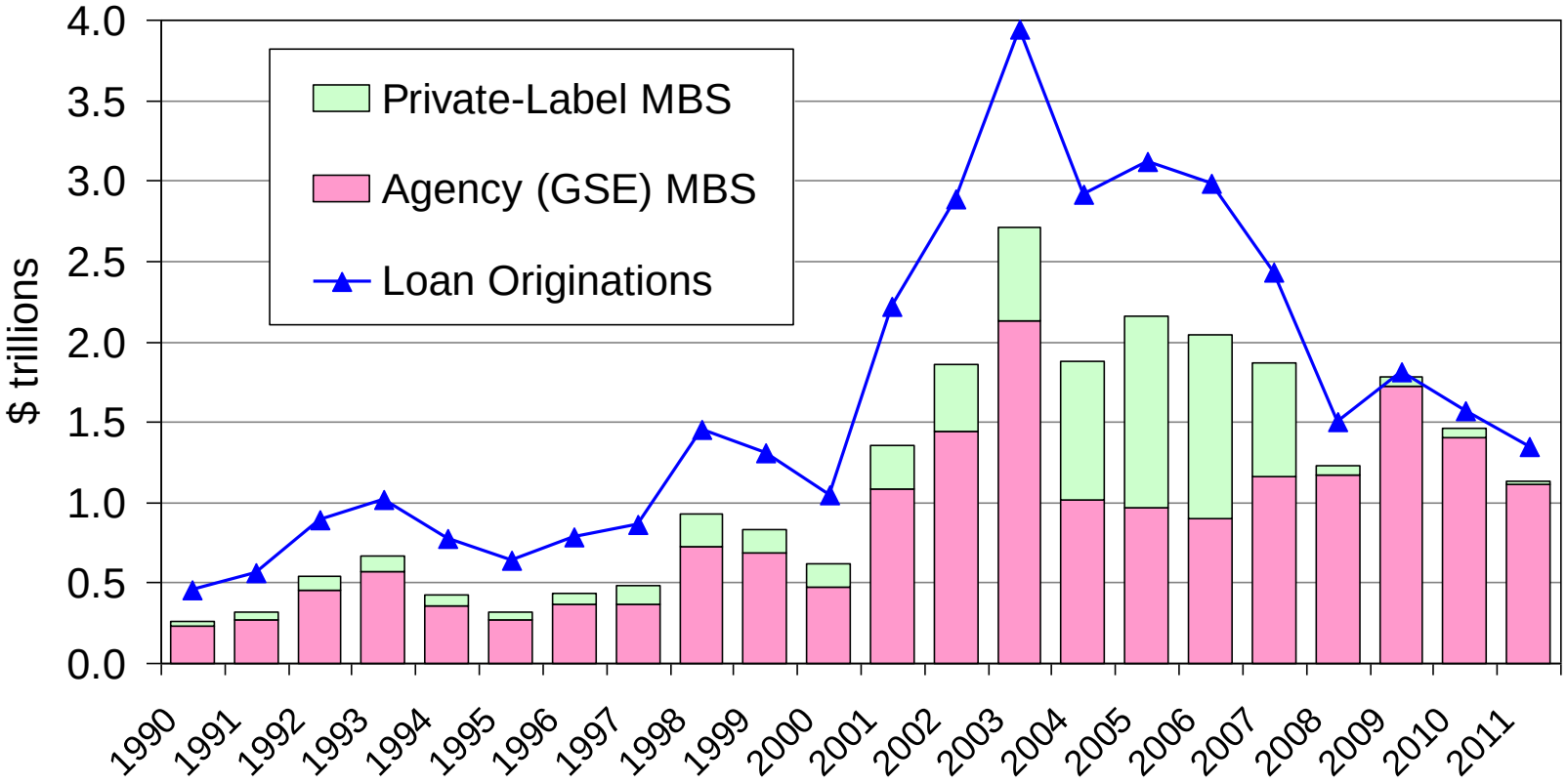
U.S. Capital Market Debt

Debt Outstanding as of 1/1/12



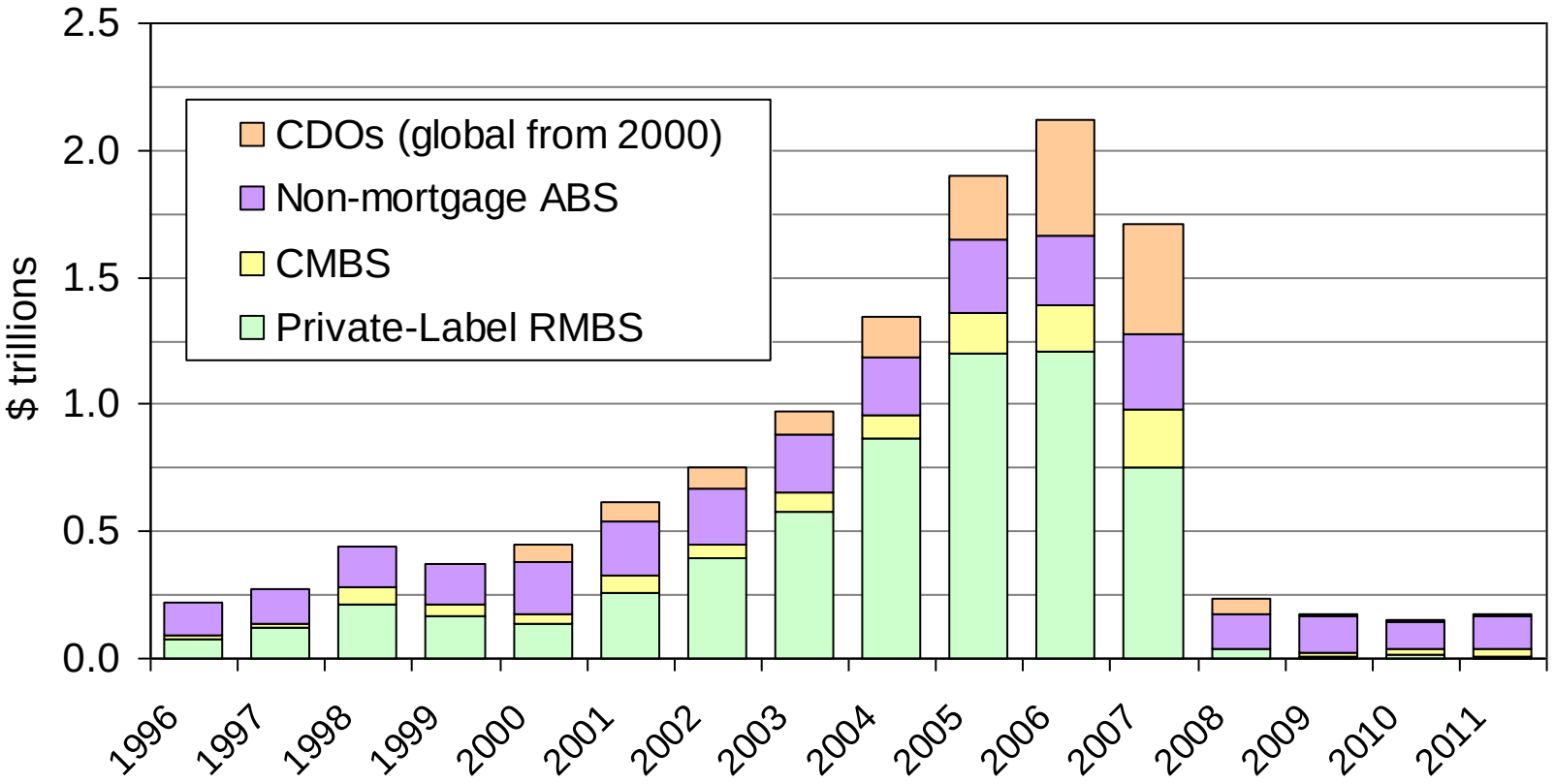
Source: SIFMA, Federal Reserve

U.S. RMBS Issuance Volume



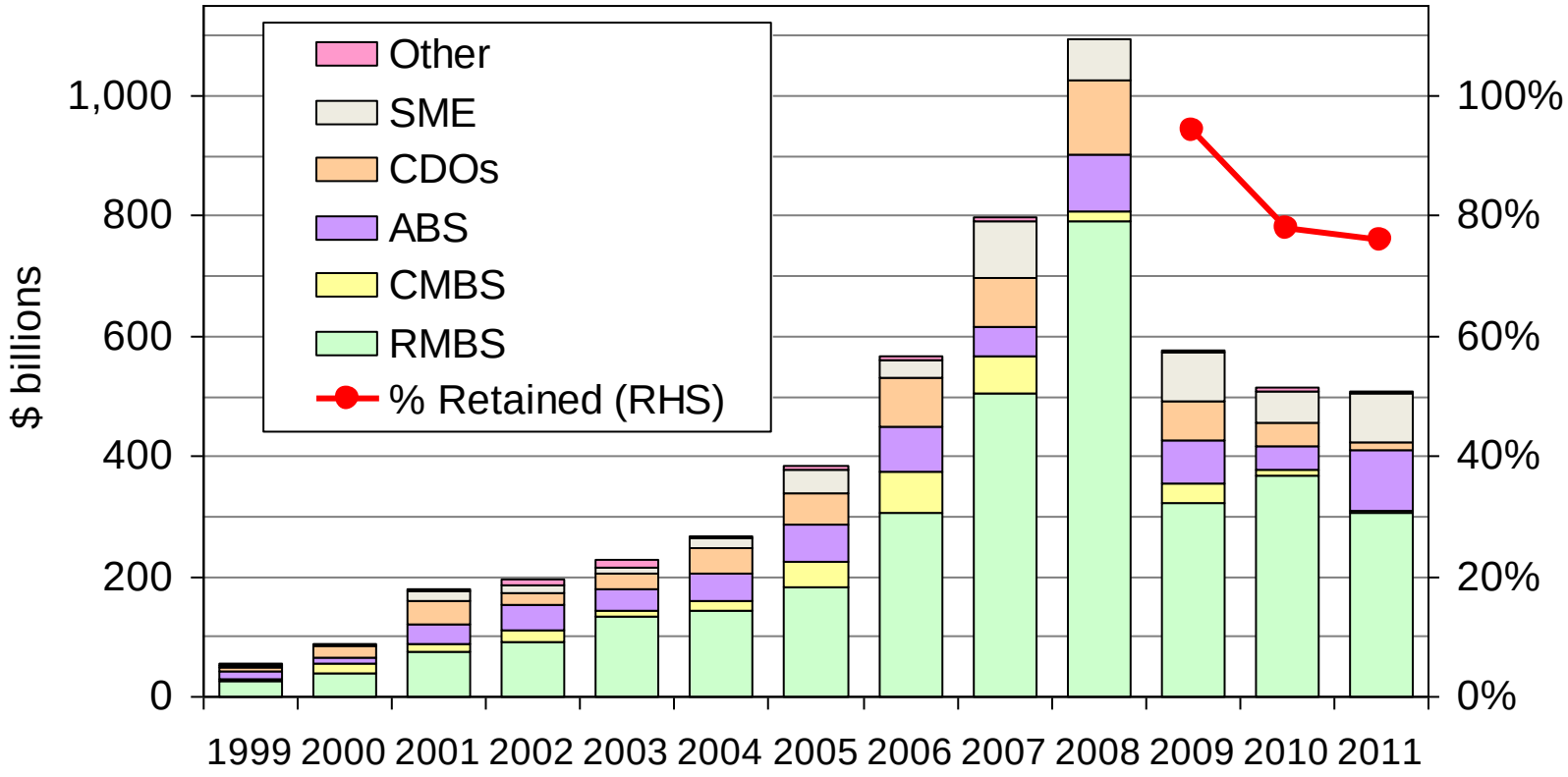
Note: Private-label RMBS includes mortgage-related ABS
Source: Inside Mortgage Finance

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

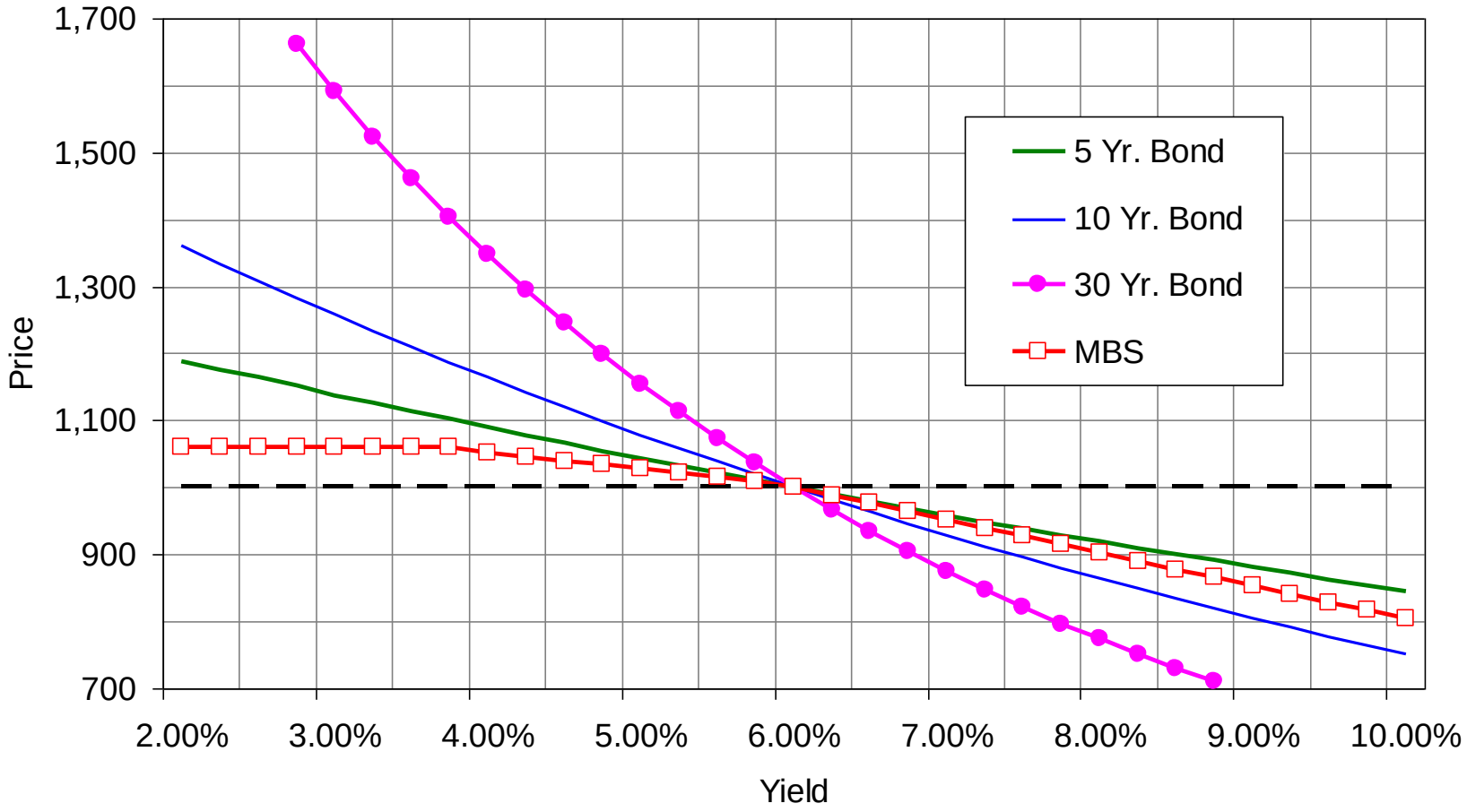
Refinancing: A Valuable Option

- 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

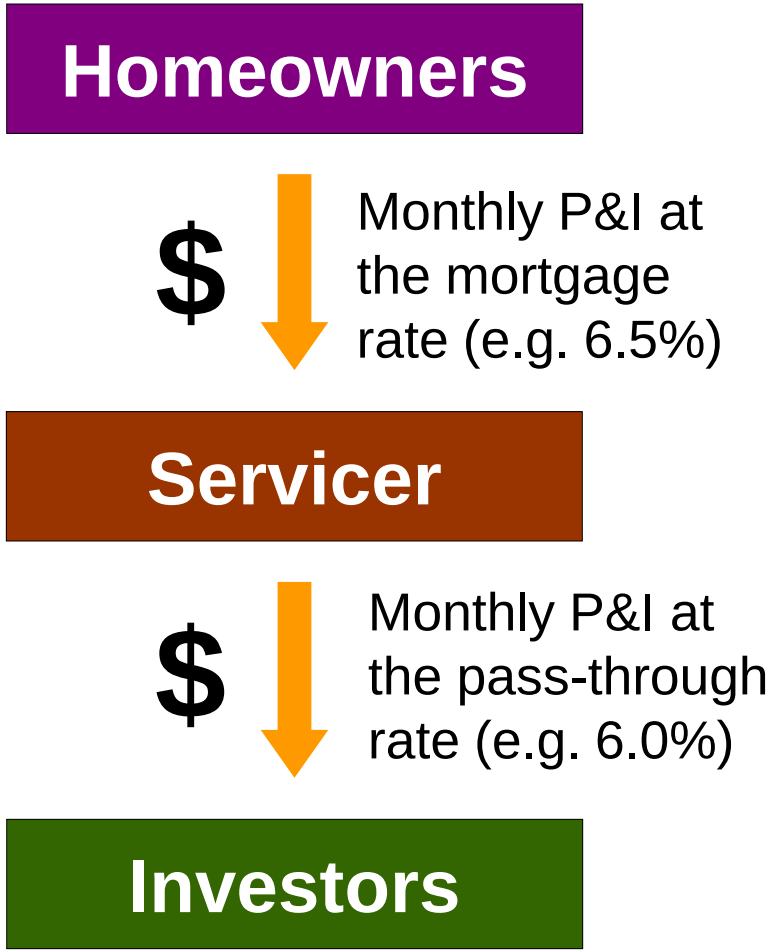


MBS Basic Features (GSE MBS)

- 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.



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^{SM} system provides much information
- The whole GSE MBS market settles trades according to a fixed monthly cycle

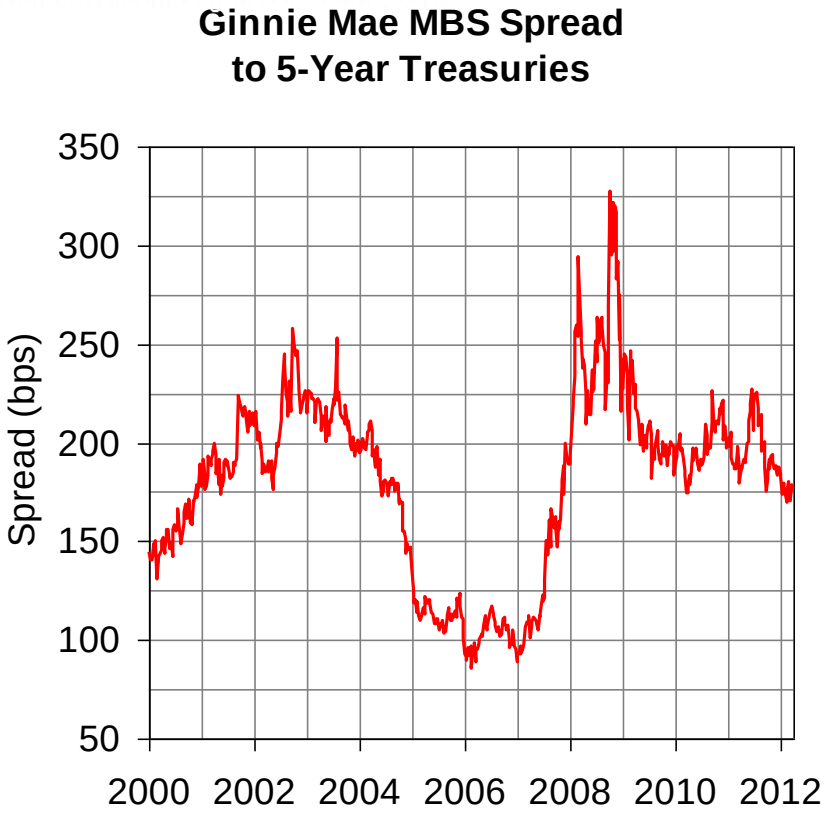
MBS Valuation

- 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

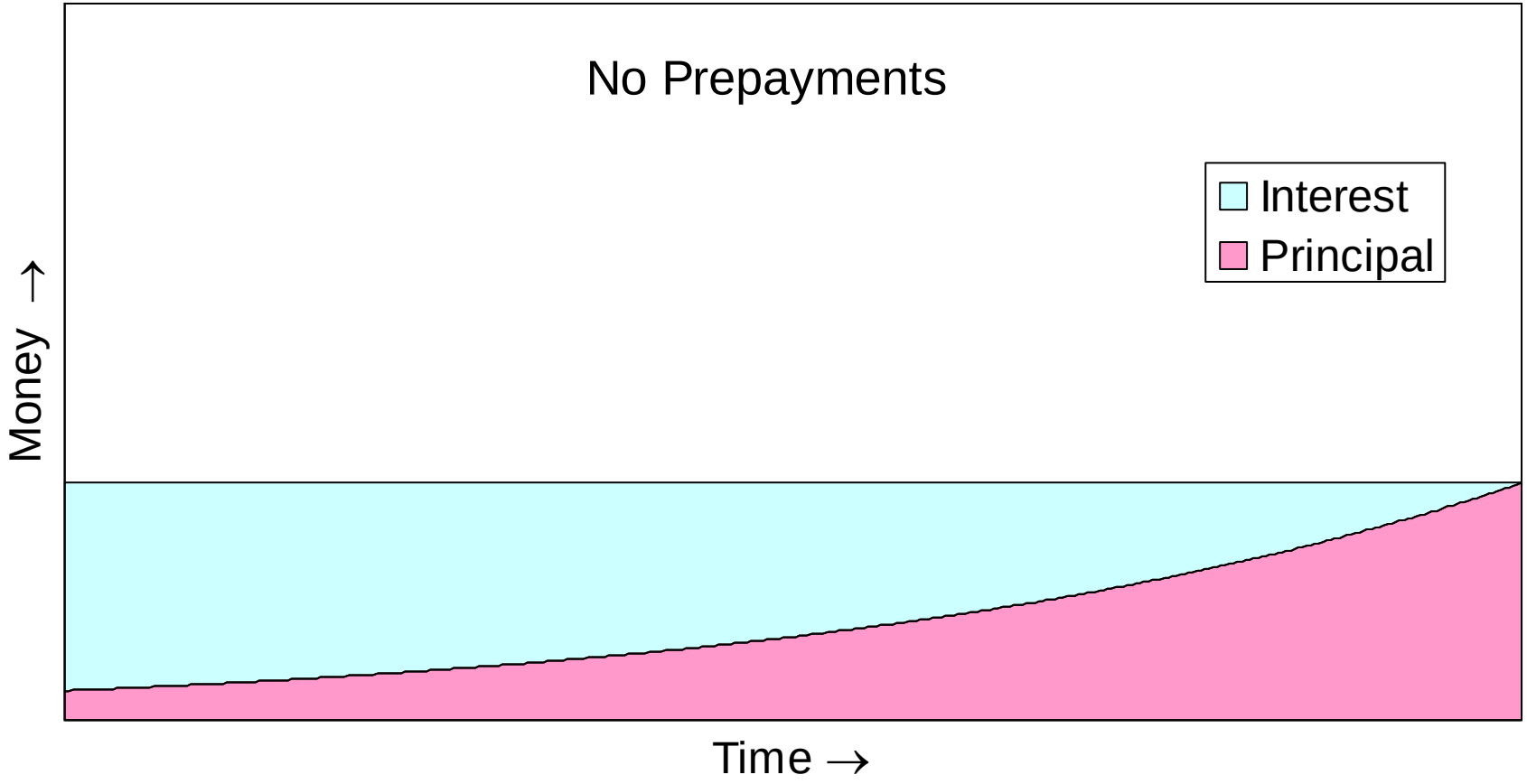
- Prepayment risk distinguishes MBS
- Comes from prepayment option in residential mortgage loans
- Gives MBS undesirable "negative convexity"
- Gives MBS higher yields than securities without prepayment risk



Source: Bloomberg MTGEGNSF, GT5

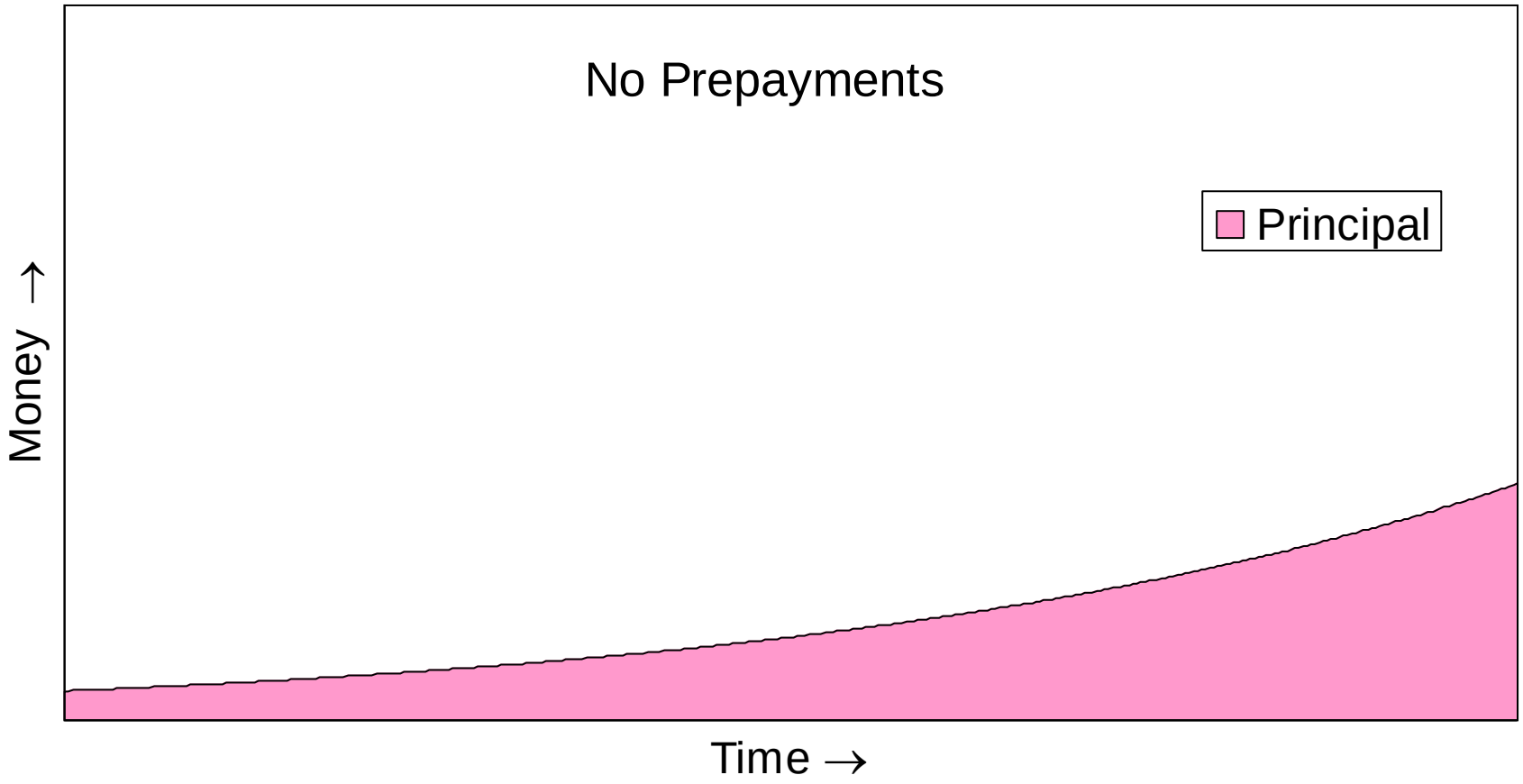
Structure: Prepayments (1)

Basic Cash Flows, 30 Year, 7% Mortgage Loan



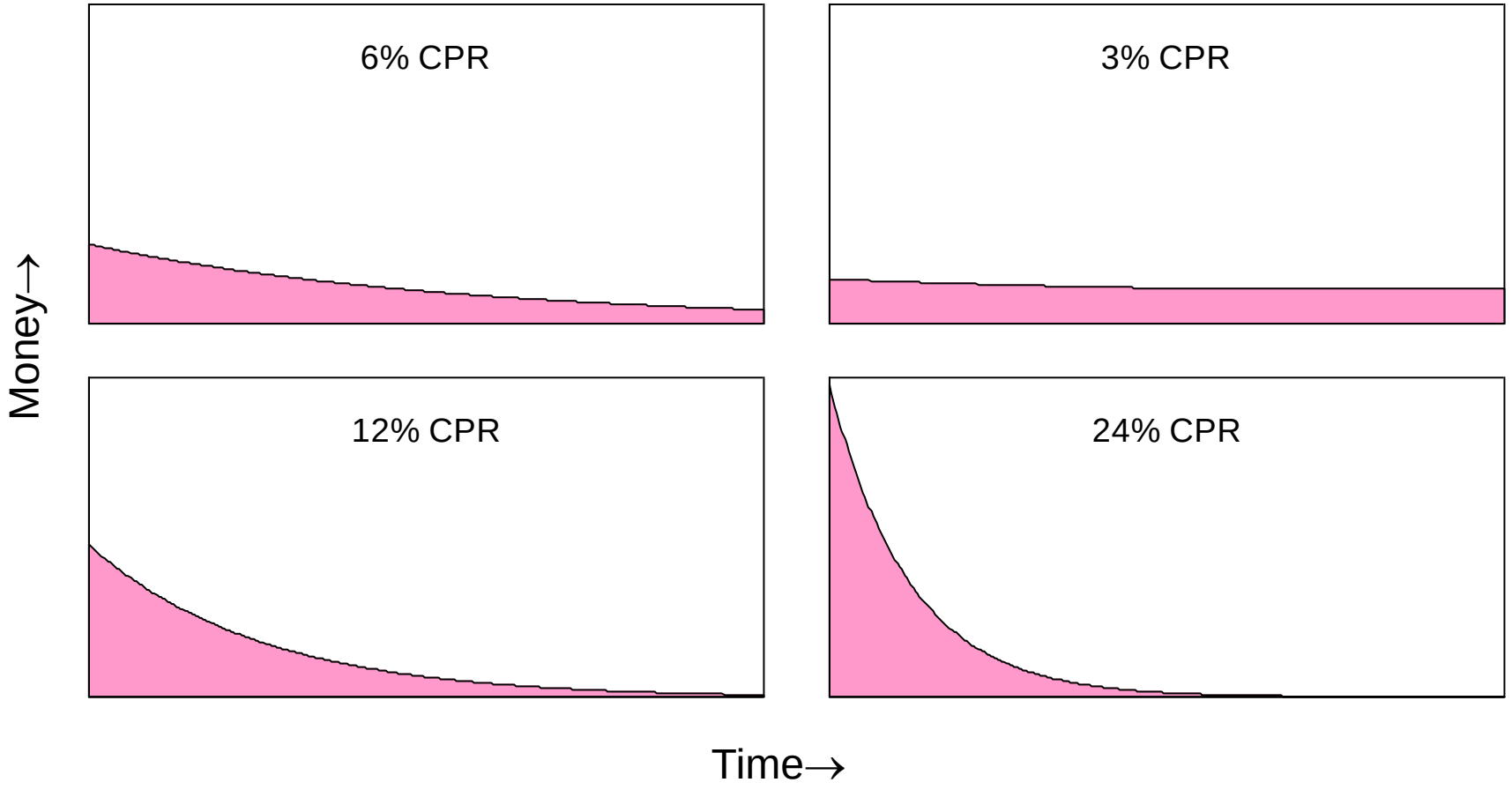
Structure: Prepayments (2)

Principal Cash Flows, 30 Year, 7% Mortgage Loan



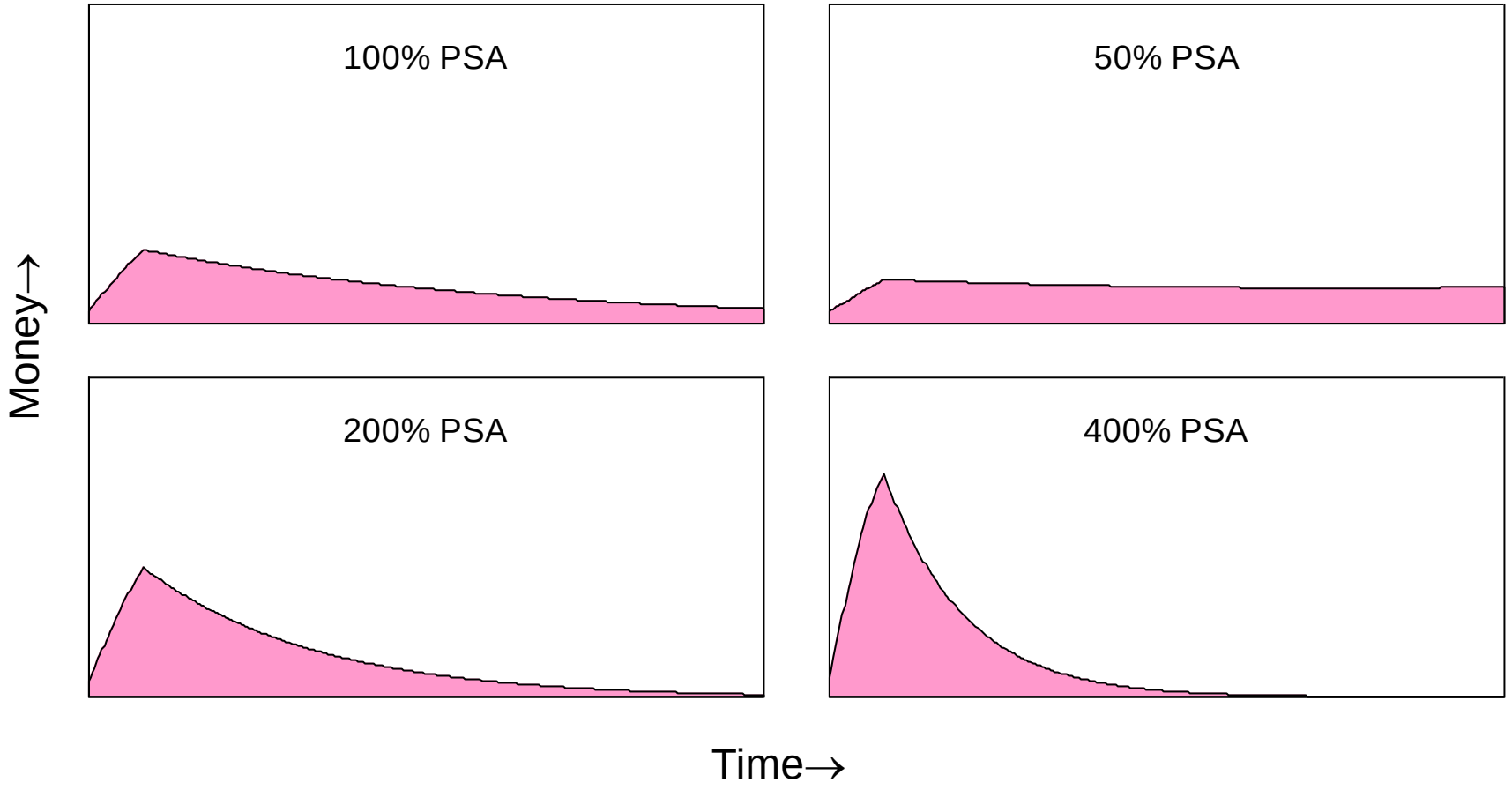
Structure: Prepayments (3)

Principal Cash Flows, 30 Year, 7% Mortgage Loan



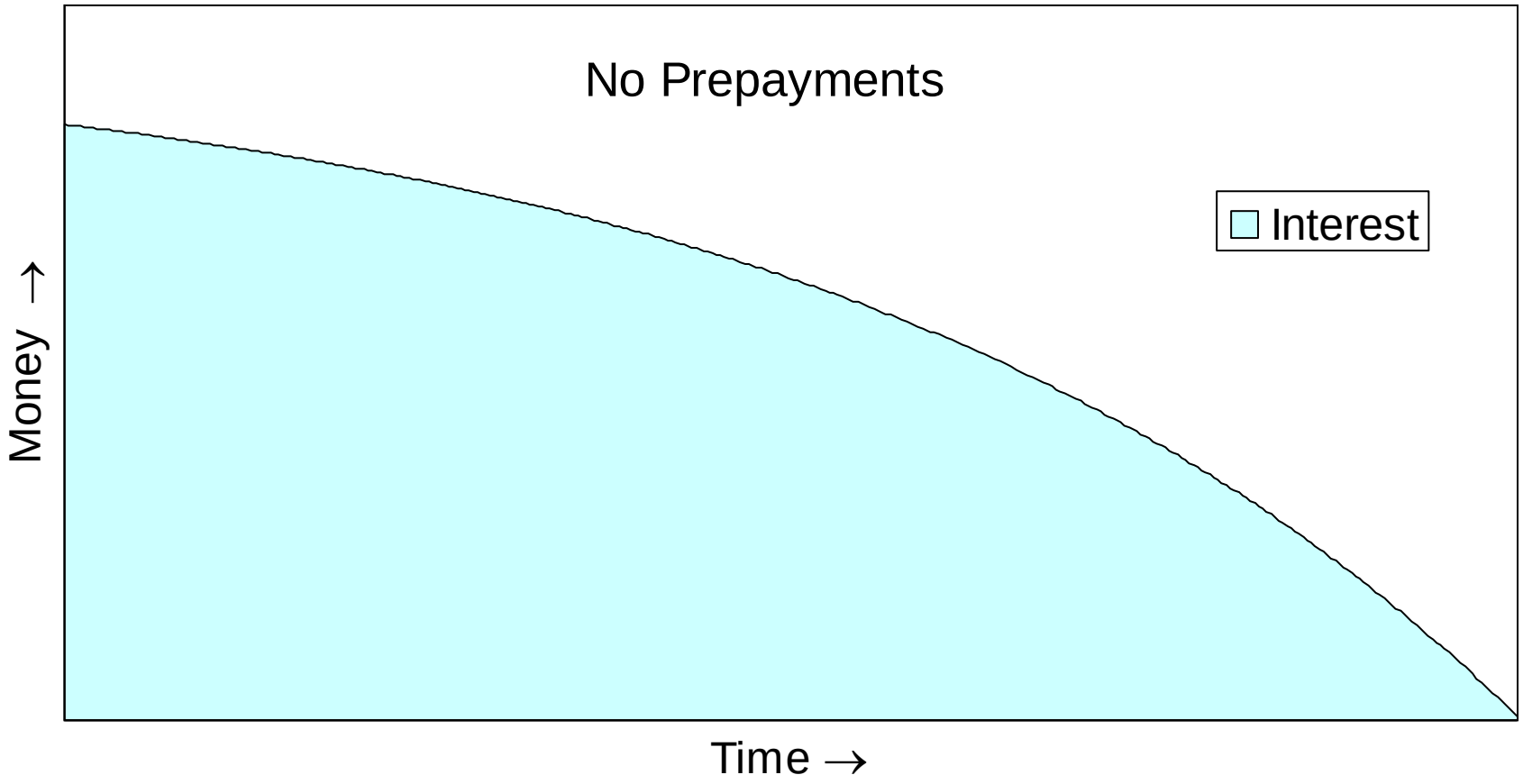
Structure: Prepayments (4)

Principal Cash Flows, 30 Year, 7% Mortgage Loan



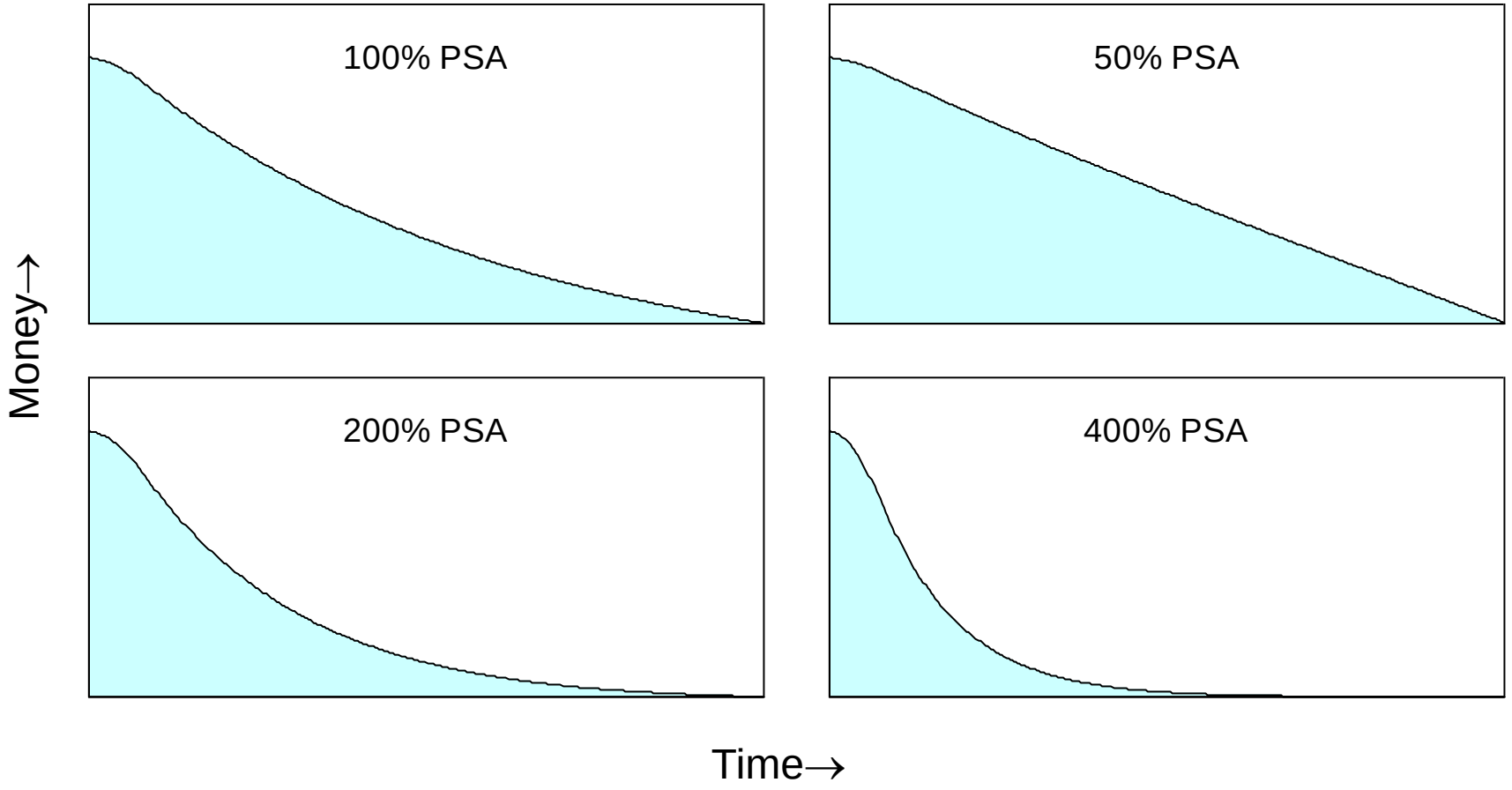
Structure: Prepayments (5)

Interest Cash Flows, 30 Year, 7% Mortgage Loan



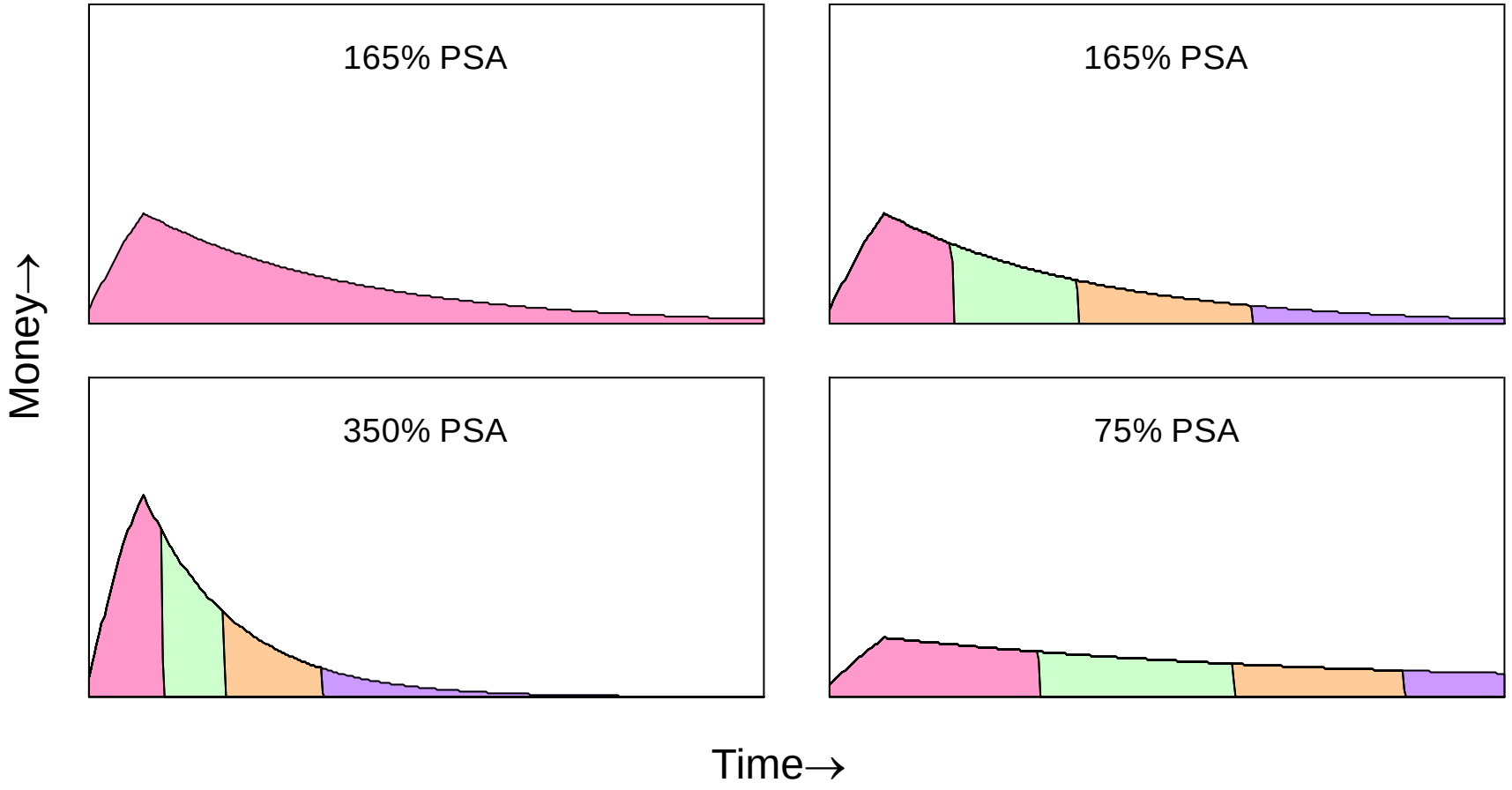
Structure: Prepayments (6)

Interest Cash Flows, 30 Year, 7% Mortgage Loan



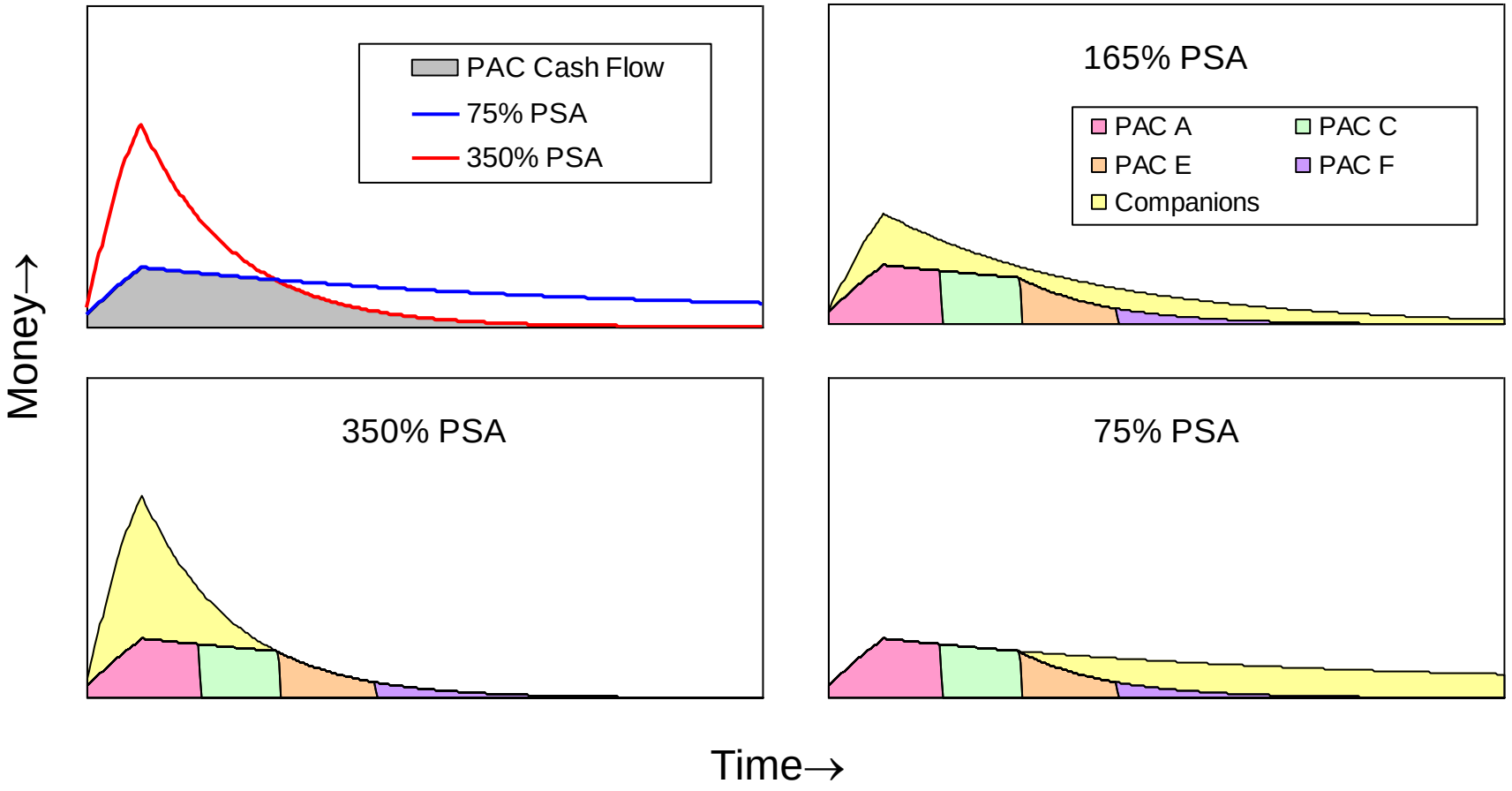
Structure: Prepayments (7)

Slicing Principal Cash Flows over Time: Building a CMO



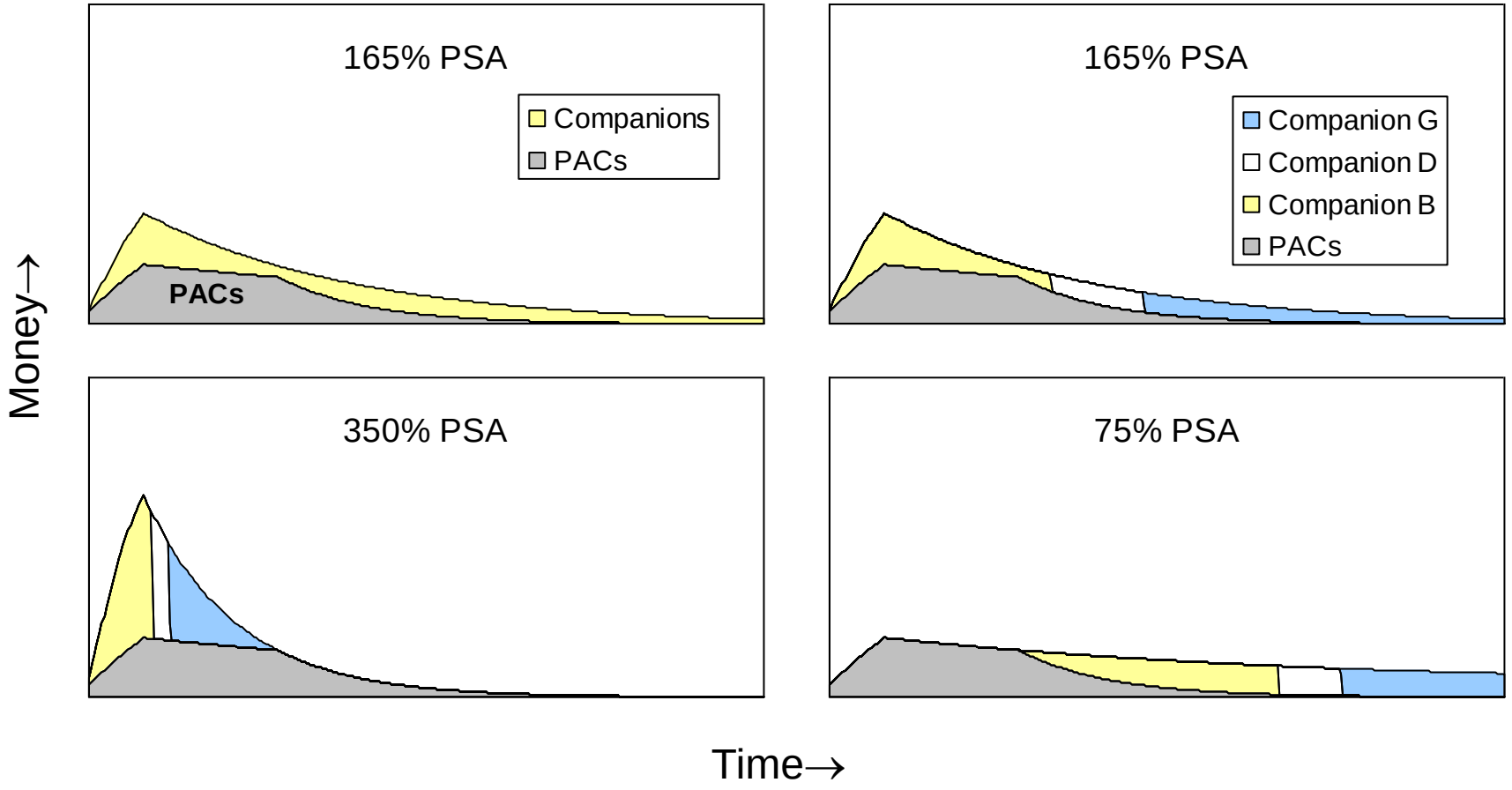
Structure: Prepayments (8)

Shifting Prepayment Risk: Building PAC Classes in a CMO



Structure: Prepayments (9)

Shifting Prepayment Risk: Sensitivity of Companion Classes

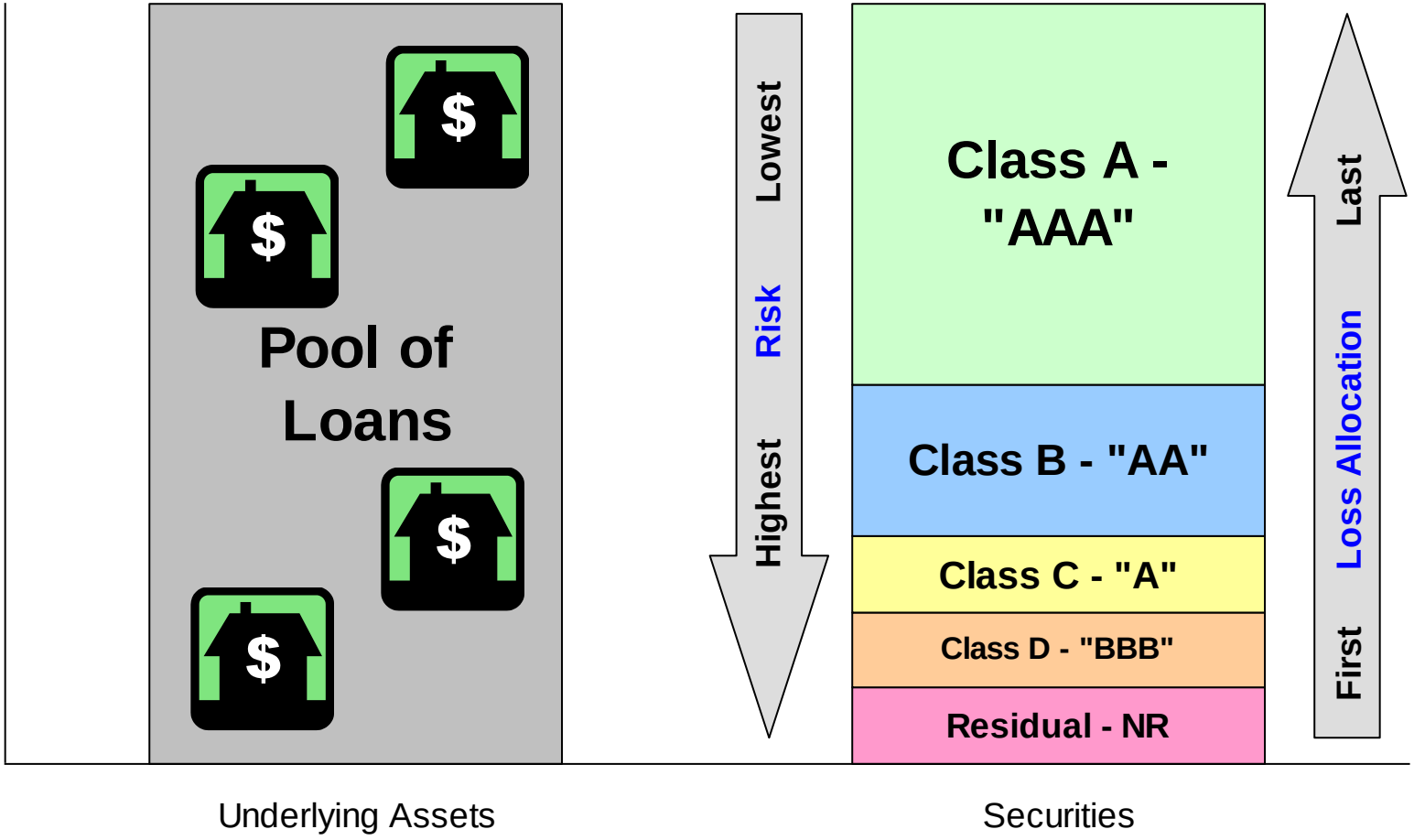


The Credit Dimension

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

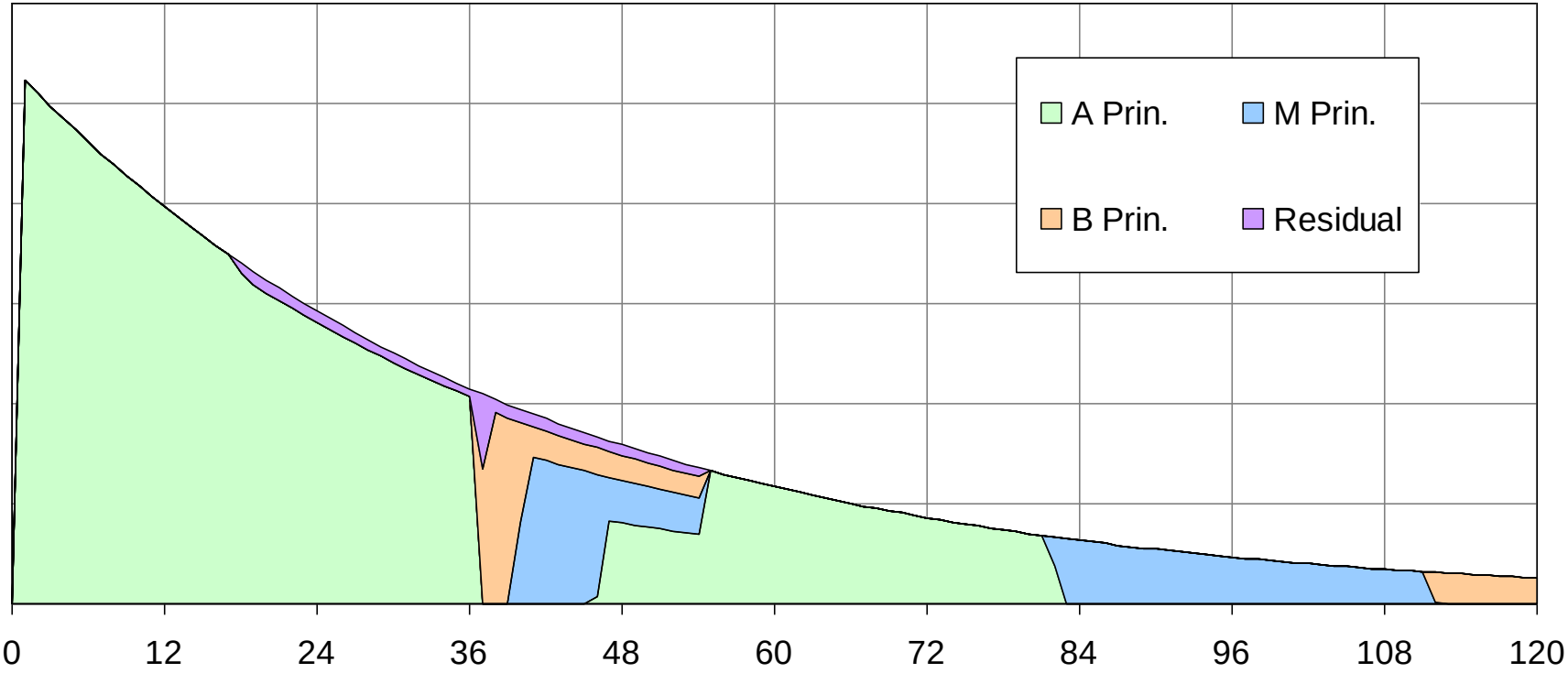


More on Credit Enhancement

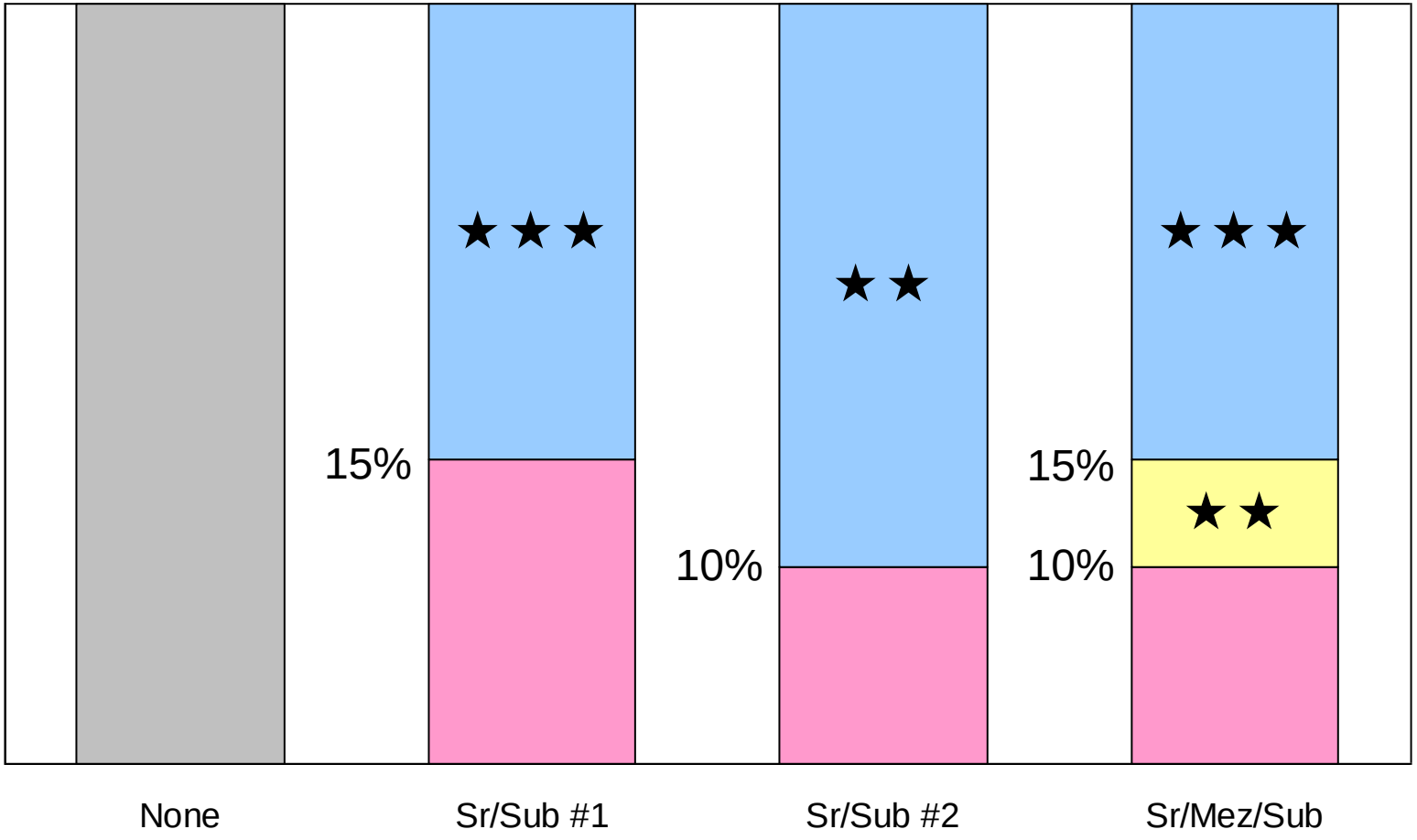
- Subordination
  - Six pack structure (jumbo and "true" alt-A)
    - Prepayment lockout: seven years or 2× subordination, phase-out, triggers
  - Excess spread/OC structure (sub-prime and weak alt-A)
    - Use ES to cover current losses and build OC (turbo)
    - Surplus ES to residual class
    - Principal lockout w/ triggers (3 years or 2×)
- Fast pay, no pay
- Reserve Fund
- Bond Insurance, guarantees

Sub-prime MBS Cashflow Example

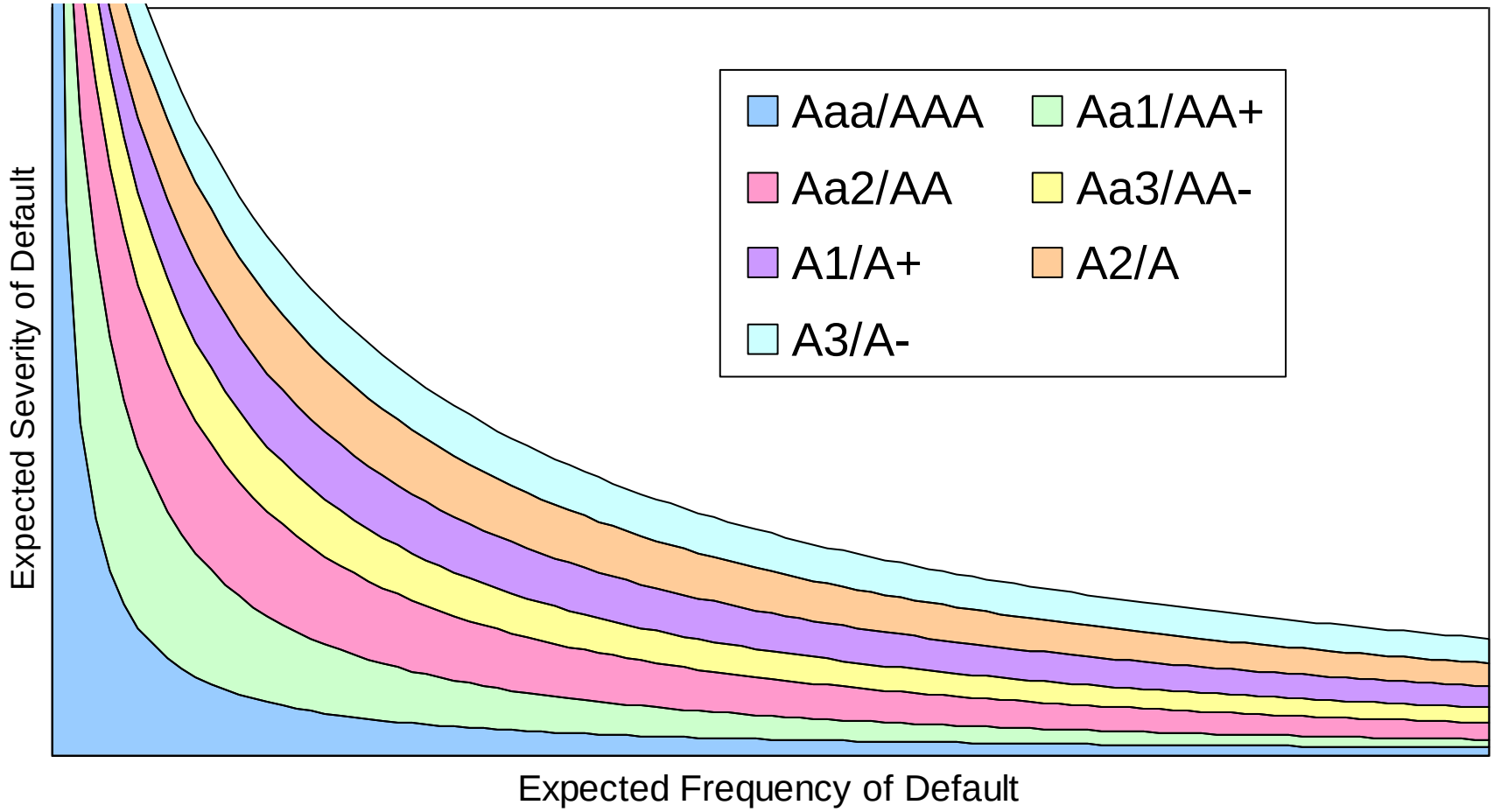
- Senior-sub, O/C (not like prime MBS six pack)
- Sequential / pro-rata / reverse sequential, with triggers



Rating Arbitrage in a Frequency-Only Rating System

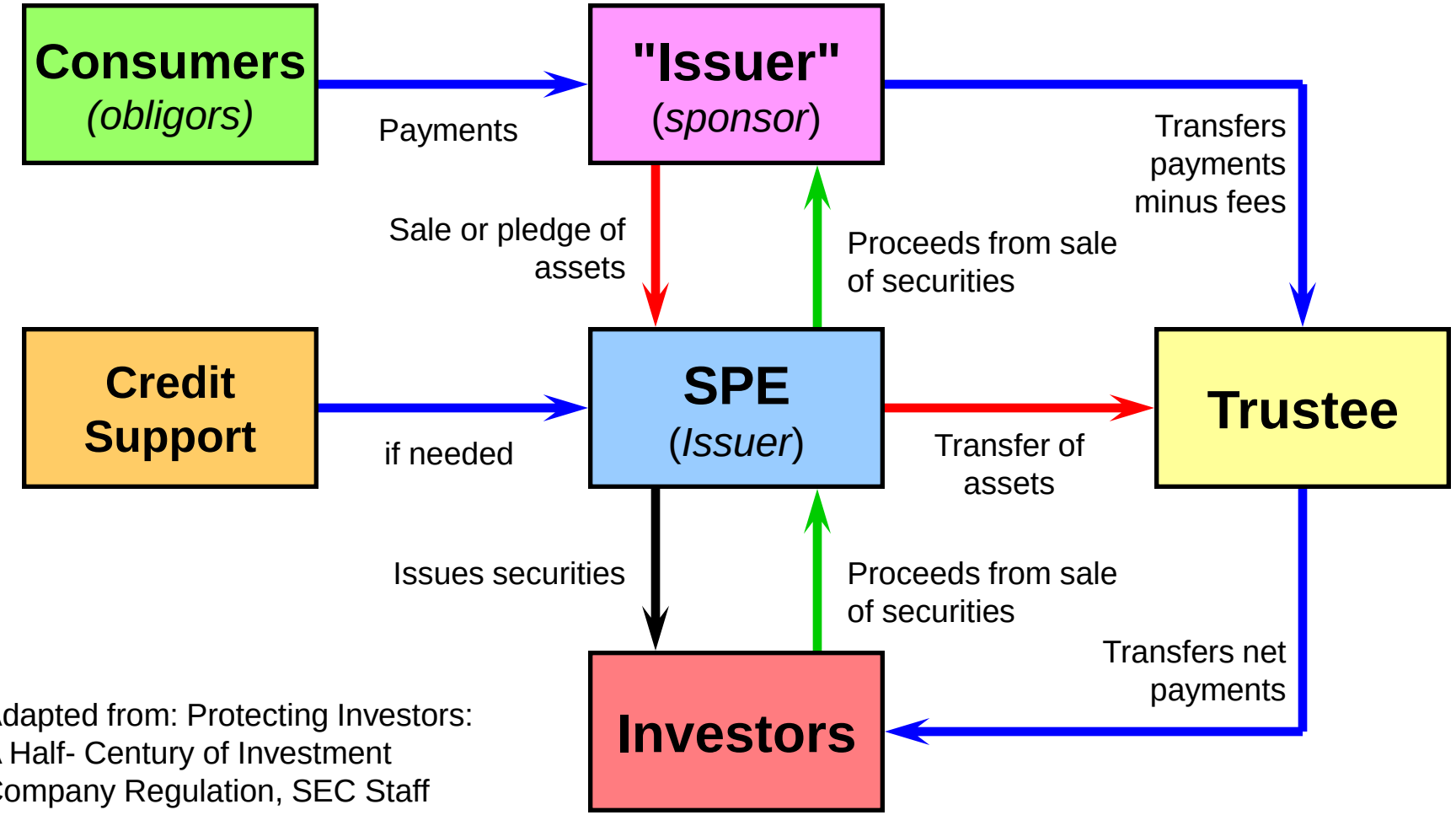


Tradeoff of Frequency and Severity in an Expected Loss Rating System



Legal Structure and Parties

Securitization Diagram



Adapted from: Protecting Investors: A Half- Century of Investment Company Regulation, SEC Staff Report, May 1992, p. 26.

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.

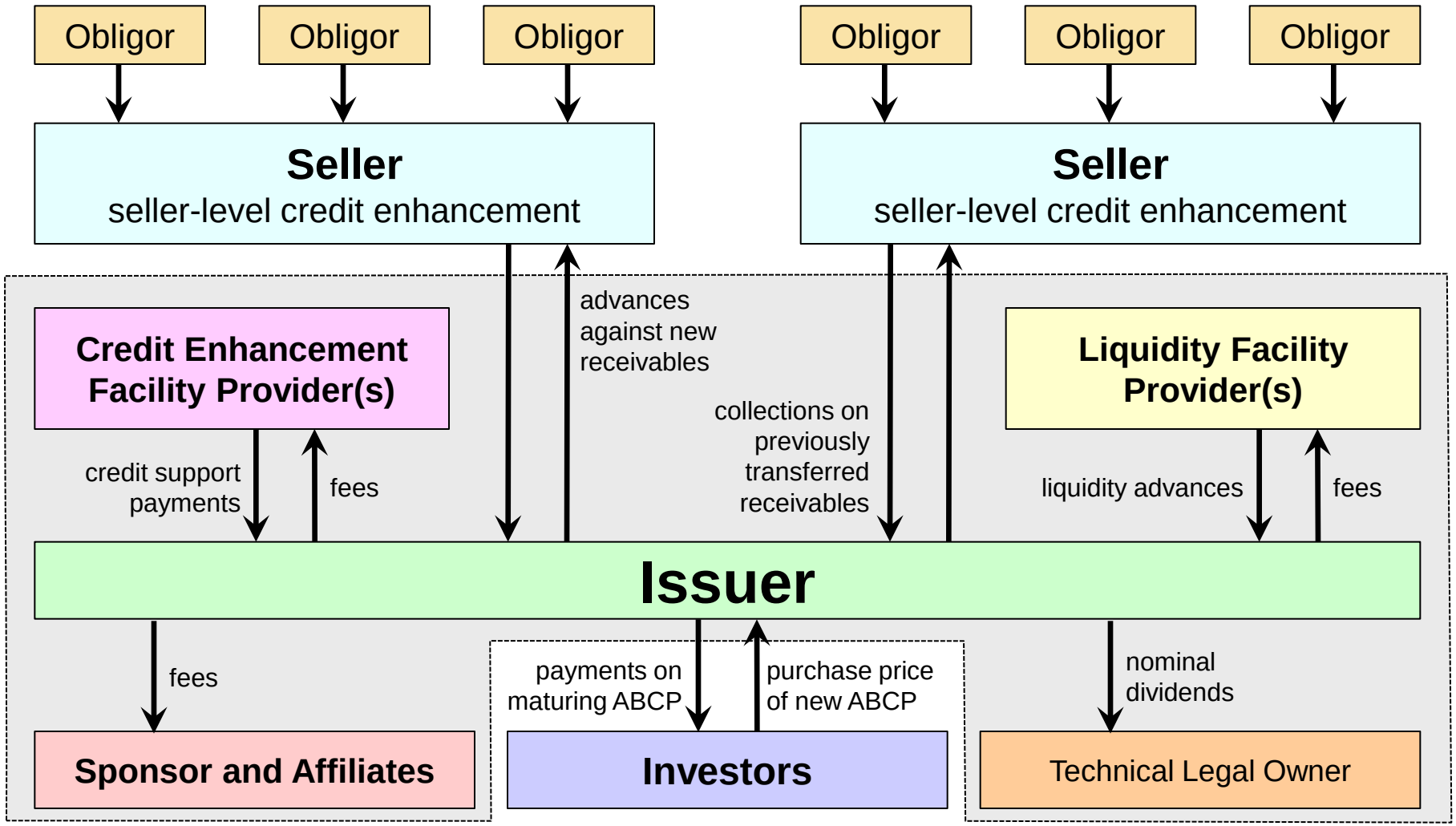
Bankruptcy & Securitizations

- Status of securitized assets remains slightly uncertain
- Securitizations use SPEs partly to address bankruptcy concerns
- Appropriate amendments to the bankruptcy code could reduce uncertainty

Bankruptcy & Securitizations (2)

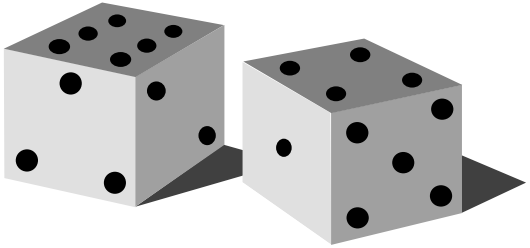
- Determining whether a securitization results in removing securitized assets from a company's balance sheet generally depends on economic substance rather than the mere form of the transaction
  - A securitization may fail to remove securitized assets from a company's balance sheet if the company retains 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

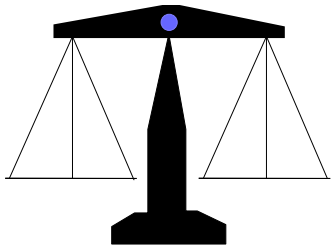
Partially Supported, Multiseller ABCP Program Structure

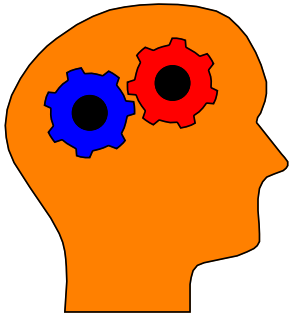


Other Players

- 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)

Risk	Cards	Autos	RE-ABS	Others
Maturity range	wide	short	wide	varies
Credit risk	low	low	low	varies
Credit risk volatility	low	low	high	high
Average life volatility	low	low	medium	varies
Negative convexity	no	no	yes	varies
Liquidity	high	medium	medium	low
Company risk	low	low	high	high
Monthly interest	yes	yes	yes	varies
Monthly principal	no	yes	yes	varies

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

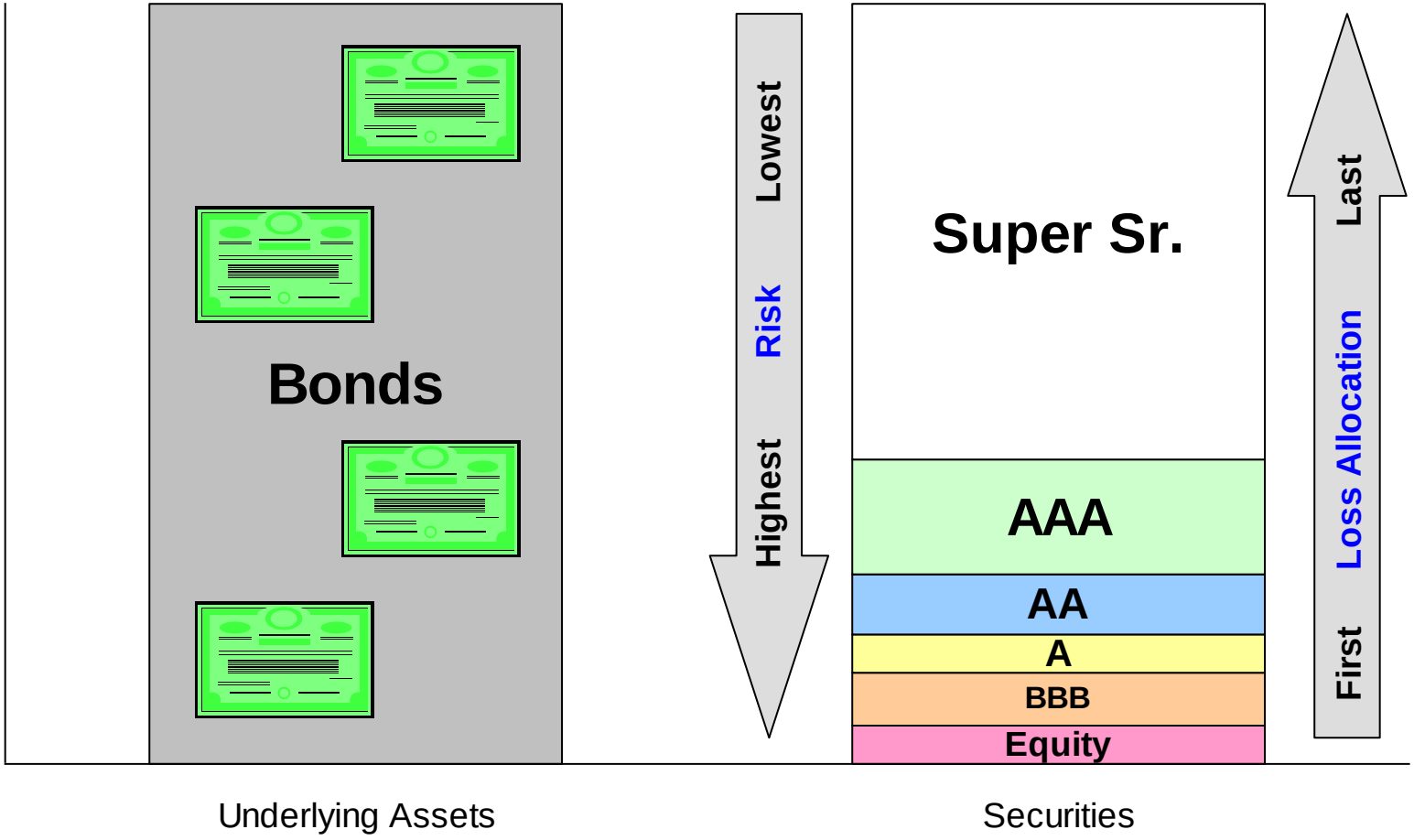
CDOs/CLOs/CBOs

Collateralized Debt Obligations

Collateralized Loan Obligations

Collateralized Bond Obligations

Basic CDO Structure – Tranching



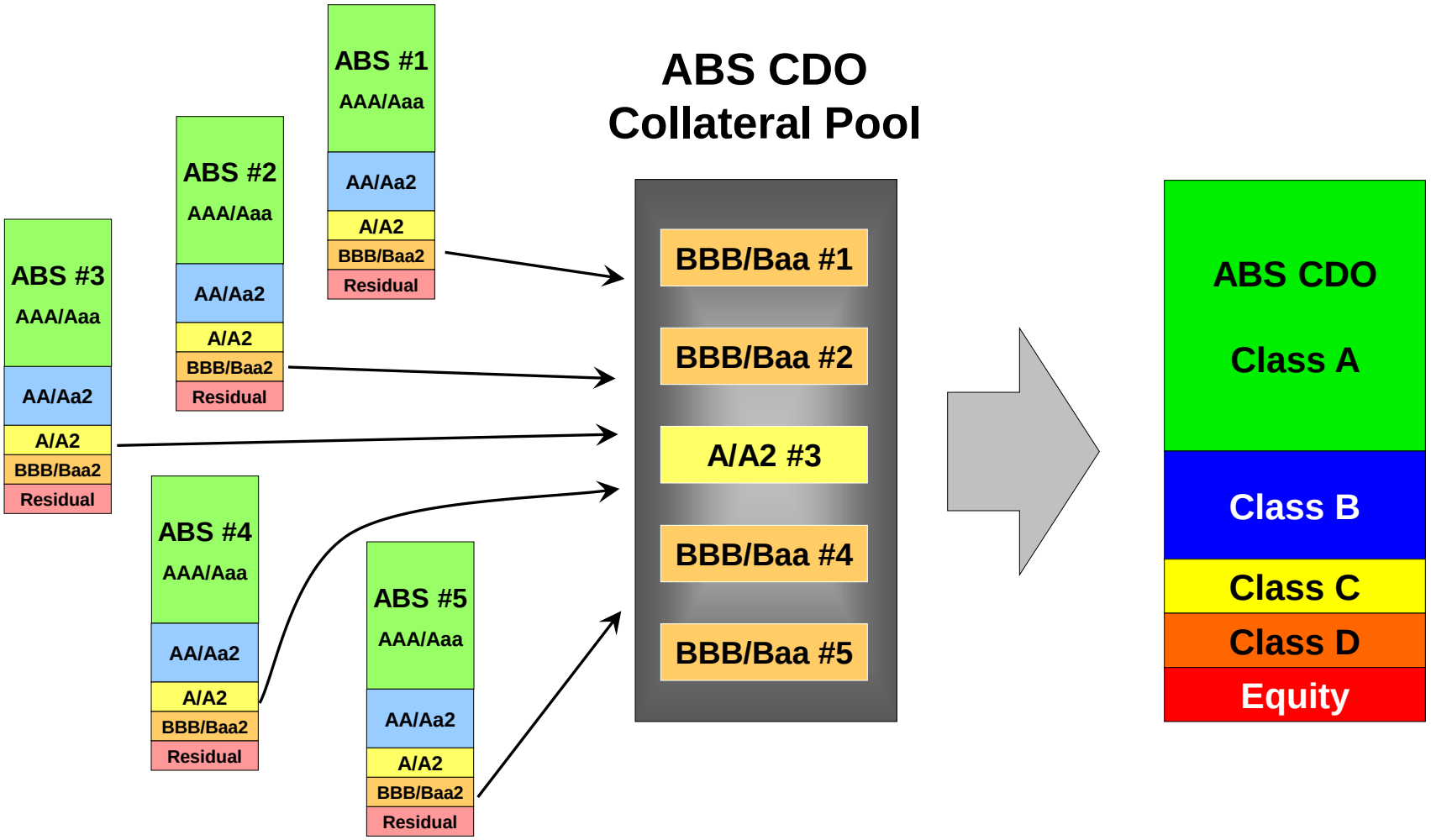
CDO Structure – Additional Features

- 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

ABS CDO – Pool of Subordinate ABS



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

Impetus for Change – Structured Finance

Adverse Credit Migrations of 2005-2007 Vintages of U.S. RMBS, CDOs of ABS, and SIV Lites					
Original S&P Rating	Status as of 31 December 2010				No. of Ratings
	Default + Near Default	Default	Near Default	Any Downgrade	
AAA	**60.1%**	**22.7%**	**37.4%**	**77.3%**	**4,043**
AA	**78.2%**	**45.8%**	**32.4%**	**87.6%**	**8,340**
A	**88.5%**	**59.7%**	**28.8%**	**93.4%**	**7,456**
BBB	**94.0%**	**69.4%**	**24.7%**	**95.2%**	**7,806**
Inv. Grade	**82.8%**	**52.8%**	**30.0%**	**89.8%**	**27,645**

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.
Source: Erturk, E., *Global Structured Finance Securities End 2010 With Rising Credit Stability* (7 Feb 2011) (Table 6a).

Impetus for Change – Financial Firms

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

Impetus for Change – Financial Firms (2)

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

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

Speaker Bio: Mark Adelson

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.

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