**550.448 Financial Engineering and Structured Products**

Week of February 10, 2014

Structured Finance

An Abstract of Legal, Accounting, & the SPE as a Corporation

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**Assignment**

- **Reading**
  - Introduction and first 3 chapters of R&R
  - Read Chapters 4 & 5 for next week (February 20)
  - Material on MBS – lecture slides and docs (Citi, RBSC, & JPM): focus on basics
  - Allman: Introduction and Chapters 1-2
    - Chapter 3 for next week (September 20)

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**Plan for This Week**

- Briefly finish MBS material
- Elements of Structured Finance
  - Legal, Accounting & the Corporate Structure for Securitization
- Introduction to the Cash Flow Model (Allman)

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**Mortgages and Mortgage Backed Securities (MBS)**

- **Bond Market Breakdown**

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**Mortgages and Mortgage Backed Securities (MBS)**

- Bond Market Breakdown

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(Mortgage Related)
- Residential (single and multi)
- Agency
- Non-Agency
- Commercial
- Asset Backed
- Mortgage Related
- H.E.L. (40% of ABS in '06)
- Non-Mortgage Related
- Credit Card Receivables
- Auto Loans
- Student Loans
- Federal Agency Debt
- FHA
- FHLMC, GNMA
- TVA
- Municipal Debt

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Dec 31, 2006

($Trillions)
Mortgages and Mortgage Backed Securities (MBS)

- Mortgage Market Breakdown

Dec 31, 2006 ($Billions)

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KEY ATTRIBUTES AGENCY vs NON-AGENCY

Mortgage Market Breakdown

- Agency Backed
  - Considered AAA Credit – Guaranteed by Government Sponsored Enterprise (GSE)
  - Mortgages used as collateral for security must conform to GSE requirements
  - Securities issued as pass-throughs

- Non-Agency Backed
  - Credit rated by S&P, Moody’s, etc.
  - Mortgages may not conform to GSEs
  - Jumbo (Prime)
  - Limited Documentation (Alt-A)
  - Subprime (credit and cashout)
  - Securities issued as credit delineated structures – not as pass-throughs

Mortgages and Mortgage Backed Securities (MBS)

- Agency vs Non-Agency

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Mortgages and Mortgage Backed Securities (MBS)

- Jumbo – Characteristics
  - Jumbo loans have balances exceeding the limit for agency conforming insurance.
  - Fixed and floating loans with this characteristic are called jumbo prime loans; hybrid rate loans are called jumbo hybrid ARMs.
  - Characteristics typical of Jumbo loans are:
    - FICO: 700+
    - Documentation: full conforming
    - Past delinquencies: 0
    - LTV: 80%
    - Mortgage insurance: Over 80%

Mortgages and Mortgage Backed Securities (MBS)

- Jumbo Hybrid ARM – Performance
  - In a refinancing environment, prepays are generally faster because large monthly payments create a bigger refinancing incentive.
  - Prepayment speeds are comparable or typically slower than agency collateral in a non-refinancing environment.
    - This creates a negative convexity worse than agency MBS.
  - Banks like these types of loans because of their high credit quality, short duration, and wider spread than agency MBS.
Mortgages and Mortgage Backed Securities (MBS)

- Jumbo Hybrid ARM – Performance
  - Agencies see these assets as fundamentally cheap, with wide OAS.
  - Hybrid ARM MBS prepayments have closely tracked those of balloon loans (loans with an amortization schedule longer than the life of the loan, forcing a large payment at maturity).

- Subprime – Characteristics
  - The borrowers in these pools typically have credit problems, prior late payments on their mortgages, prior bankruptcies, or general problems with their bill paying histories.
  - Typical characteristics of Subprime MBS are:
    - FICO: 500 - 640
    - Documentation: Full or Limited
    - Past delinquencies: Up to 120 days
    - LTV: 80%
    - Mortgage insurance: rarely over 80%

- Subprime – Performance
  - Note that 80% of these loans are hybrid fixed / floating, with two to three year fixed periods.
  - Many of these loans are interest only.
  - Subprime loans are typically less rate sensitive than agency MBS. Prepayments are typically dependent on increases in collateral value (where borrowers then can take cash out by refinancing) and credit curing.
  - Subprime MBS typically have less negative convexity than agency MBS.
  - Subprime loans create an opportunity to increase margins and returns since they have higher coupons; however, these loans do have riskier borrower credit performance than prime asset classes.
### Mortgages and Mortgage Backed Securities (MBS)

#### Subprime – Performance
- There has been increasing regulatory pressure on sub-prime asset classes related to consumer protection laws, as well as increasing credit enhancement due to rating agencies revisiting their models.
  - Moody’s changed their standard requirements in May of 2004,
  - S&P revised their standards in November 2004, and
  - Revisions from Fitch in 2005.

#### Alt-A – Characteristics
- Alt-A pools consist of mortgages that are between prime and subprime credit quality, or have other features that disqualify them from being classified as Prime.
- One way to look at Alt-A securities is by dividing them by:
  - Prime Alt-A: borrowers who are prime but missing documentation (self-employed, no employer references, etc.)
  - Non-prime Alt-A: strong subprime borrowers, sometimes called Alt-B

### Mortgages and Mortgage Backed Securities (MBS)

#### Alt-A – Characteristics
- Characteristics typical of Alt-A collateral are
  - FICO: 640 - 720
  - Documentation: limited
  - Past delinquencies: once in the past twelve months
  - LTV: 70% - 95%
  - Mortgage insurance: sometimes

### Market color:
- Sub-prime origination volume grew 50.8% from 2002 to 2003.
- Debt consolidation continued to expand.
- A large part of the subprime market are borrowers new to the lending market, possibly coming from another country. As this demographic increases, the subprime market is expected to increase – and did until, of course, 2008.
Mortgages and Mortgage Backed Securities (MBS)

- **Alt-A – Performance**
  - Alt-A securities typically have slower CPR than MBS of jumbo prime collateral.
    - For Prime Alt-A, prepayments are typically slower than those of prime pools in the first year and mimic prime prepayments in later years.
    - Non-Prime Alt-A usually have prepayments similar to those of subprime initially, or slightly faster (since they do have better credit quality); then they speed up if their credit quality improves and the borrower can refinance at a prime rate.
  - The Alt-A market usually has lower prepayment risk than a prime pool, and lower default risk than a subprime pool.

Mortgages and Mortgage Backed Securities (MBS)

- **MBS Structures – Basic MBS Pass-Throughs**
  - Agency MBS are initially issued in pass-through form
    - In a pass-through security, the interest and principal payments of the underlying collateral are passed to the security investor, less a servicing fee.
    - Fixed FHLMC pass-through securities are called Gold PCs, and floating securities are called Arm PCs.
    - FNMA pass-thrus are referred to as Fannie Mae MBS.
Mortgages and Mortgage Backed Securities (MBS)

- **MBS Structures – Basic MBS Pass-Throughs**
  - Structured products with various characteristics can then be created utilizing these pass-thrus.
  - Non-agency collateral are called whole loans before they are securitized.
    - Pools of loans might be sold in the market in a whole loan bid, or securitized by the originator.
    - Pass-thrus can be created out of this collateral, in addition to more structured products.

- **MBS Structures – Collateralized Mortgage Obligations (CMOs)**
  - CMOs are created by pooling mortgage pass-throughs or whole loans and by splitting their cash flows into tranches.
  - A CMO is self-supporting, i.e. the collateral cash flow is able to meet the tranches' cash flow requirement.
  - Tranches vary by:
    - Average life;
    - Coupon;
    - Stability;
    - Prepayment risk; and
    - Credit Rating/Risk.

Mortgages and Mortgage Backed Securities (MBS)

- **CMO Characteristics**
  - There are agency and non-agency CMOs, just as there are agency and non-agency MBS.
    - Agency CMOs carry the same guarantee / insurance as agency MBS.
    - There is no need for credit enhancement in these structures owing to the agency guarantee / insurance; so tranching is used to create bonds of different average lives or performance characteristics.
    - CMOs created out of whole loans do not carry the agency guarantee / insurance and are structured to create credit enhancement in addition to different average lives and performance characteristics.
Mortgages and Mortgage Backed Securities (MBS)

- CMO Characteristics
  - Some examples of CMOs are:
    - Sequential pay classes;
    - Planned amortization classes (PAC);
    - Targeted amortization classes;
    - Support Classes;
    - Z bonds;
    - Accretion-direct classes;
    - Floaters and inverse floaters; and
    - Interest only / principal only.
  - We will explicitly consider CMO and other liability structures later

Brave New World of Structured Finance

- The Credit Collapse of 2007-2008
  - A Referendum on the Modern Fiduciary Conscience
  - NOT a repudiation of Structured Finance
  - Structured Finance: a way to raise capital
  - Structured Finance is NOT Corporate Finance

Brave New World of Structured Finance

- What is Structured Finance?
  - An information-based financial decision process
  - Unifies core financing, operating, and investing activities inside the corporation from a cash flow (CF) perspective
  - Emphasis on planning, process, & governance which promotes capital efficiency
    - By contrast, with corporate finance where resource decisions are made by human decision-makers and subject to discretion
    - In structured finance, resource governance is carried out within the inflexible control structure of the bond indenture – no discretion
    - Credit analysis takes place entirely within the transaction

Elements of Securitization Law

- Securitization and off-balance-sheet financing are enabled through Law
- The two key issues have to do with
  - Bankruptcy Law
    - Specifically as it relates to restructuring and counting the assets of the Transferor in a bankruptcy proceeding
  - Commercial Law
    - Specifically, as it relates to the ownership of the assets in the securitization transaction
    - Who gets legal claim of an asset for their balance sheet?
    - True Sale
Elements of Securitization Law

- True Sale
  - Determination of whether a structured transaction can claim its assets as the consequence of a true sale
  - The Trinity of True Sale
    - The structure is truly non-recourse
    - Assets under the structure are identifiable & countable
    - The exchange of assets for value takes place at “fair value”
      - If not, bankruptcy court can void the sale

- Process of Legal Structuring
  - Bankruptcy Remoteness is the key analytical point

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Elements of Securitization Law

- Process of Legal Structuring
  - Achieving Bankruptcy-Remoteness
    - A corporation is established with the sole purpose of housing the transaction (the “transferor’s” off-balance-sheet vehicle), referred to as the Special Purpose Entity (SPE)
      - Special in that its only purpose is to hold assets, but also
      - To withstand attack should the transferor file under bankruptcy law
    - Attacks would assail the following
      - True Sale
      - Perfection of Security Interest – transfer must follow the procedures of the Uniform Commercial Code (UCC) and the interest is attached to the SPE
        - Seller empowered to make transfer
        - There is “consideration” for the transfer (it is paid for)
        - There is an authenticated security agreement itemizing the collateral

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Elements of Securitization Law

- Process of Legal Structuring
  - Achieving Bankruptcy-Remoteness (continued)
    - Non-Consolidation: Show the SPE is inextricably linked to the seller
    - Sale at Fair Value (a real concern these days)
    - Others
  - While we focus on the protection of the SPE from the “seller”; investors in the SPE (bond buyers) need to be protected from the insolvency of the SPE
    - Legal & Tax -- like any company
    - Solvency in its operation -- the structure

- Registration, Disclosure, Distribution, and Trading

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Elements of Securitization Law

- Registration, Disclosure, Distribution, and Trading
  - Securities Act of 1933 (disclosure details for registration)
  - Securities Exchange Act of 1934
    - Registration/Reporting for securities in the public markets
  - Sarbanes-Oxley Act of 2002 (CEO/CFO identification)
  - Trust Indenture Act of 1939
    - Trustee must file conflict of interest statement for each obligor
  - Investment Company Act of 1940
    - Issuers of structured securities must demonstrate exemption
  - Regulation AB
    - Disclosure of all parties/qualifications in a structured transaction

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Elements of Securitization Law

- Regulating the Structured Finance Markets
  - Basel/Banking Supervision
  - SEC
  - Federal Reserve
  - OCC
  - FDIC
  - OTS
  - NAIC (Insurance Commissioners in the states)
  - CFTC
  - ISDA

Elements of Securitization Law

- Regulating the Structured Markets (Continued)
  - AICPA (Accountants)
  - FASB
  - The SEC-designated NRSROs
    - Nationally Recognized Statistical Rating Organizations

Elements of Securitization Accounting

- Standards-setter for corporate accounting
  - Financial Accounting Standards Board (FASB)
  - What to do with securitization accounting?
    - Still unresolved
    - Where are we?

- Crux of the issue: materiality and “state”
  - For corporate finance, state and materiality exists at a courser level than suitable for structured finance
  - For example, in structured finance, “state” includes the term structure of delinquencies – relevant in measuring risk and the prospect of repayment

- Nonexistent in a traditional corporate finance accounting structure of Generally Accepted Accounting Principles (GAAP)
  - The term structure of delinquencies is un-measurable and un-reportable under GAAP as it is not in the state space of GAAP
Elements of Securitization Accounting

- Rationalizing Securitization Finance under GAAP
  - Accounting approach can take one of several paths depending on who (what kind of institution) is reporting
    - Borrower vs. Investor
    - Mortgage (FAS 115) or Non-mortgage (FAS 65)
      - Agency MBS vs. ABS
    - Even worse than multiple treatments for the same transaction
      - Rule for valuation depends on whether intent is to hold to maturity: value depends on intent?

Elements of Securitization Accounting

- Rationalizing Securitization Finance under GAAP
  - Sell-side institutions under GAAP treated according to their exposure to operational risk
    - Variable Interest Entity (VIE): a hybrid
      - May have recourse to borrower; absorb most operational risk, but not all; whoever bears the majority of risk must absorb to balance sheet if it does not sell 51% or more of expected losses to a 3rd party
      - Equity < E(L)
      - Follows FIN 46(R)
    - Create for structures that violate trinity of true sale: liability holders price-in recourse to a 3rd party for unknown risks hidden in the structure

Elements of Securitization Accounting

- Rationalizing Securitization Finance under GAAP
  - True Sale Securitization: FAS 125/140
    - FAS 140 motivated creation of a new financial object, a special category issuer that qualifies (under FAS 140) for deconsolidation: Qualifying Special Purpose Entity (QSPE)
      - The QSPE – What is it / What does it do?
        - FAS 140 created for structures that violated trinity of true sale; liability holders price-in recourse to a 3rd party for unknown risks hidden in the structure
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        - FAS 140 created for structures that violated trinity of true sale; liability holders price-in recourse to a 3rd party for unknown risks hidden in the structure
Elements of Securitization Accounting

- True Sale Securitization: FAS 125/140
  - The QSPE
    - To achieve deconsolidation under FAS 140 requires
      - True sale and nonrecourse opinion
      - Two-step (Double-SPV) transfer process
    - There is a provision for deconsolidation for the revolving period during the ramp-up phase in those transactions that benefit (from a revolving period)

Elements of Securitization Accounting

- FAS 115: Debt/Equity Investor Accounting
  - Specifies Valuation based on Intent
    - If the asset trades principally for near term sale
      - Carried on the balance sheet at fair market value
      - Changes in value are reflected in the Income Statement as Current Earnings
    - If the asset is Available for Sale (AFS)
      - Carried on balance sheet at fair market value
      - Changes in value are reflected in Other Comprehensive Income, but not in Current Earnings
      - If fair value drops below its amortized historical cost for more than a temporary period, then it is deemed impaired – the unrealized loss is recognized as a current loss in the Income Statement
    - If the asset is Held to Maturity (HTM)
      - Carried at an amortized historical cost basis subject to write-downs
      - Difficult to change status or liquidate

Elements of Securitization Accounting

- FAS 157: Fair Value Measurement
  - Defines “fair value” within GAAP and provides additional guidance to prevent too much model risk or manipulation of the numbers being reported
  - FAS 157 recognizes impact of market distress with the “forced” sale
  - Stipulates a framework for allowable valuation techniques
    - Market Prices
    - Income/Cash Flow
    - Replacement Cost

Deconstructing the Corporation

- The Context for Describing Operations and Operational Risk
  - Structured Finance Micro-Market
    - Timely incremental movements of cash through accounts in the payment system
    - Risks associated with/contingent title/custody arrangements governed under the indenture
  - Macro Market
    - Relationship between
      - Buyers
      - Sellers
      - Others (Agents, Professional support, Regulators and Data Vendors)
Deconstructing the Corporation

- The Context for Describing Operations and Operational Risk
  - Meta Market
    - Mesh of Credit, Operating, and Governance systems
    - Through which Structured Transactions flow
    - Changing the velocity of money
    - Transforming the structures of capital & risk

Deconstructing the Corporation

- Market Micro-Structure
  - Operation
    - Servicing an amortizing loan pool is simple, compared to a corporation
    - Enables the true sale SPE (QSPE under FASB 140) to be amenable to rule-based governance and automation
      - Fortunate for the borrower as it facilitates the capture of cost-of-funds arbitrage
    - SPE is structured to satisfy bankruptcy-remoteness with rigorous constraints on scope of operations – the funding "machine"
      - Servicers, trustees, custodians, swap counterparties are the proverbial cogs in the machine

Deconstructing the Corporation

- Market Micro-Structure
  - Constitution: The Pooling and Servicing Agreement
    - The most important operational document is the PSA
    - Spells out precisely how to
      - Segregate cash inflows from the general accounts of the seller/servicer
      - Set up trust accounts
      - And to whom funds of the trust are distributed, including for reinvestment
    - All important to analysis when modeling the deal because it is the definitive, contractually binding transaction structure

Deconstructing the Corporation

- Market Micro-Structure
  - Payment Mechanics
    - Account structure enforces segregation of collections from the servicer/seller by passing the receivables directly into a trust account owned by the SPE
  - Following the Money – The Time Line
    - Record Date
    - Collection Period (usually, 1 month)
      - Collection Account & the daily sweep – nothing is left exposed
    - Determination Date (focus on the asset side of SPE balance sheet)
      - Servicer summarizes the most recent collection period: interest, penalty interest, principal, prepay, delinquencies, recoveries, surety bond payments, etc.
Deconstructing the Corporation

Market Micro-Structure

- Following the Money – The Time Line (continued)
  - Calculation Date (focus on the liability side of SPE balance sheet)
    - Servicer establishes the amounts due bond holders and all third parties as a consequence of the Determination
    - Includes trigger provisions, reserve/spread accounts, etc
  - Distribution Date
    - Servicer passes the amounts Calculated to the paying agent with payment instructions to pay the ultimate recipients
  - Payment Date
    - Amounts sitting in the various sub-accounts are wired to their intended recipients (servicer, note holders, trustee, etc)

Deconstructing the Corporation

Market Macro-Structure

- Buyers
- Sellers – Originator, (Transferor), Issuer (SPE)
- Agents
  - Intermediaries bringing buyer & seller together
  - Collateral Managers/Servicers/ Program Administrators
  - Custodians/Trustees
  - Clearing & Settlement Agents
  - Issuing & Paying Agents
- Professional Services – Lawyers & Accountants
- Regulators
- Data Vendors

Deconstructing the Corporation

Primary Market & the Closing

- Lien on title is transferred to issuer in exchange for cash at closing
- Investors receive the notes in exchange for cash at closing

Deconstructing the Corporation

Operational Flows

3rd Parties not in flow

- IB: advisor, underwriting, distribution (commission)
- Lawyers: Opinions (TS & NC) + Documents (fees)
- Accountants (fees)
- Ratings Agencies (commission)
Deconstructing the Corporation

More About Agents

- Arranging the Transaction (prior to Origination)
  - An Investment/Commercial Bank
    - Placement
  - Underwriting/Structuring the Transaction

- Structuring: Creating the design for redistributing the risks of the pool across different classes of securities
  - According to prevailing market risk/return demands
  - Meeting investor appetite
  - In "compliance" with rating agency criteria
  - As the underwriter may become an investor, has the potential to represent both sides of the transaction

- Servicer – Sell-side allegiance
- Trustee – Buy-side allegiance

Deconstructing the Corporation

More About Agents

- Clearing Agent – collects funds and verifies transaction information
- Settlement Agent – Finalizes sale and oversees transfer of ownership from seller to buyer
- Data Vendors – Huge, new role in supporting this market
  - Aggregation and transmission of performance data (servicer reports) and trustee reports
  - Describing the “state” of a transaction adds value

Deconstructing the Corporation

Market Meta-Structure: To Build A Better Model

- Nationally Recognized Statistical Rating Organization (NRSRO)
  - SEC-licensed credit rating agency
  - Designs contracts for off-balance sheet financing
    - Focus is on primary issuance
    - Little support for secondary trading
  - What is in the future?

- Over the Counter Market
  - Can this be improved?