The purpose of this course is to provide the student with a comprehensive understanding of both theory and practice in residential and commercial real estate debt and equity capital markets. These markets finance approximately two thirds of all residential debt in the US and about one quarter of all commercial real estate debt. They are also at the heart of the recent real estate bubble, collapse and ensuing lackluster performance in the US economy. The approach will be to make sure students first have a thorough grasp of the relevant theories and models used to value these assets and then to critique the limitations of these theories. As a final project, students will be grouped into teams and given residential and commercial real estate securities to analyze on a Bloomberg to make investment decisions.

All students who would like to understand these critical markets are welcome. The course would be particularly appropriate for students wishing to pursue careers in trading, creating, investing in, researching, selling or regulating residential and/or commercial real estate securities. The course is also recommended for students wishing to pursue careers as developers or investors in residential and commercial real estate properties themselves (“the dirt”) but want to understand how to fund their ventures via these instruments and how volatility in the capital markets for these instruments can create opportunities and risks in the property markets themselves.

Specifically among the topics the course will cover are:

a) The US residential mortgage finance system and basic mortgage math

b) The agency mortgage backed securities markets (GNMAs, Fannie Maes MBS and Freddie MAC MBS).

c) The non-agency MBS securities markets (option ARMs, alt-A, sub-prime, jumbo securities etc).

d) Commercial real estate mortgages and commercial mortgage backed securities (CMBS)

e) High yield commercial real estate mortgage instruments (B-notes, mezzanine debt, B-pieces, IOs)

f) Structured agency and non-agency residential real estate instruments e.g. agency collateralized mortgage obligations (CMOs).

g) Residential and commercial real estate collateralized debt obligations (CDOs) and credit default swaps.
h) MBS relative value analysis (option adjusted spreads, option adjusted duration, negative convexity)

i) Prepayment and default modeling of residential and commercial mortgage backed securities.

j) Legal foundations, financial analysis and structuring of Real Estate Investment Trust (both commercial real estate REITs and mortgage REITs).

k) The link between real estate capital markets, real estate property markets, leverage and rates. Understanding the causes and consequences of the real estate bubble, bust and why 10 year Treasury yields are the lowest in history.


Overall, the course will be a mix of qualitative and some straightforward quantitative work to provide the student with an intuitive understanding of the subjects covered. No prerequisites beyond Stern core classes are needed. Some cash flow modeling in Excel will be done as well as use of a Bloomberg terminal.

The course will also include industry practitioners as guest lecturers and a teaching session on Bloomberg.

**Course Assessment**

Final Exam TBD During Final Exam Period (Dec 14 – Dec 21)
Class will be split into teams to do team analysis and write-ups of actual CMBS, Agency MBS and Non-Agency MBS bonds on Bloomberg.

**Course Assessment (approximate):**
Cases and Assignments 15%
Class Participation 20%
Mid-Term 20%
Final Exam and Bloomberg Project 45%

**Course Schedule**

1: Course Introduction and Real Estate Price Dynamics (Sept 24)

- Outline of the course
- Background and history of the residential (“subsidizing the American Dream”) and commercial real estate finance markets
- Fundamental determinants of commercial and residential real estate prices (Discounted Cash Flows, IRR, Net Operating Income, leverage)
- Measurement of commercial and residential property prices
2: Mortgage Contracts and Mortgage Math (Oct 1)

- Residential mortgage contracts
- Different types of residential mortgages (prime, subprime, alt-A, option ARMs, FHA, VA, agency, non-agency (“the rich get richer and the middle class borrow…”) will be analyzed
- Mortgage mathematics (amortization, calculating payments, points, NPV, prepayments, ARM resets, caps, floors, etc)

3: Mortgage Risks and The Residential Mortgage Finance System (Oct 8)

- Securitization and the funding of residential mortgages – GSE vs non-agency credit enhancement techniques
- Mortgage servicing
- Pass Through Securities and collateralized mortgage obligations: (“If you don’t know where the rich bond is, chances are you are holding it.” - Howie Rubin, Soros)

4: Modeling RMBS Cashflows: Theory and Reality (Oct 15)

- Cash flow modeling of agency residential mortgage backed securities (RMBS)
- Prepayment Modeling: (Hope, HARP, HAMP, HELP – oh yes, economic incentives are important too)
- Default modeling of Non-agency residential mortgage back securities
- Diversification (“My ventures are not in one bottom trusted) and deception
- 1 hr Guest lecture: Top ranked Wall Street prepayment and default analyst (TBD)

5: Agency MBS and CMOs valuation, Hedging, Risk (Oct 22)

- Cash flow spread, Option adjusted spread, beyond OAS,
- Prepayments, defaults, duration, negative convexity, hedging
- Bank risk management (“sort of”) techniques and mortgages

6: Non Agency MBS Market (Oct 29)

- Valuation
- Structures
- Collateral Analysis

7. Mid-Term then Commercial real estate property analysis (Nov 5)

- Introduction to commercial real estate (property markets)
- What is commercial real estate (different types, retail, industrial, multifamily what determines its value)
- Fundamentals of commercial real estate leases
- Property level pro forma analysis
- Real estate due diligence
- The use and selection of cap rates
8: Commercial real estate finance markets (Part 1 - Theory) (Nov 12)

- Commercial real estate debt finance (providers of commercial real estate finance – banks, insurance companies, CMBS, CRE CDOs, multifamily GSEs)
- Commercial real estate debt finance, the borrowers perspective, proceeds vs coupon and other issues depending on the financing source
- Different types and structures of commercial real estate debt finance (land, construction, bridge financing, mini-perm, stabilized finance, mezzanine debt, B-notes, preferred equity)
- Underwriting and overwriting mortgages
- Performance of commercial mortgages

9: Commercial real estate finance markets (Part II - Reality) (November 19)

- Analyzing CMBS and CRE CDO investments (key metrics, DSCR, Debt Yield, LTV, prepayment protections etc)
- What happens when things go bad – bankruptcy, defaults, workouts, hope notes, foreclosures, deed in lieu etc.

10: Real Estate Investment Trusts (November 26)

- Commercial real estate investment trusts structures
  - Evaluating and analyzing REIT debt
  - Evaluating and analyzing REIT equity
  - Mortgage real estate investment trusts (the S&L/SIV game…again?)

11: Real Estate Investment Trusts (continued) and Non US Real Estate Markets (Dec 3)

- REITs: Tax Treatment and other issues.
- Non US Real Estate Markets

12: The Real Estate Crisis: A Perfect Storm (Dec 10)

- Causes of the Crisis (Federal Reserve Policy, securitization, deregulation and lax enforcement of existing regulations)
- The government’s response (short term releveraging TALF, TARP, Dodd Frank sections related to residential and commercial real estate finance); new capital market proposals (CRD 3, SSFA etc)
- Residential finance markets versus commercial real estate finance markets (lessons learned and not learned)
- Which is better government intervention or laissez faire: the residential and commercial real estate finance markets compared.
- The Way Forward