

Syllabus Real Estate Capital Markets – Spring semester AY 2015-16

This syllabus is subject to future revisions

Instructor

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Office Hours: By appointment, or after class in the classroom.

Teaching Assistants

TBA

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Class Time

The class meets twice per week on MW from 6-9pm for 6 weeks. There is a 20 minute break around 7.30pm. The venue is TBA. The first class is on 5/16, the last class is on 6/27 (final exam).

Content

Real Estate Capital Markets studies debt and equity secondary markets linked to real estate assets. In Real Estate Capital Markets, we generally take the perspective of a *secondary market investor*, such as an investor in mortgage-backed securities, or the common equity of a REIT. The course places considerable emphasis on securitization, the housing finance system, the GSEs, the subprime mortgage crisis and related topics. The course will be relevant both to people with an interest in real estate, and those interested in fixed income markets.

On the debt side, we will study features of commercial and residential mortgages, and mortgage math. We will then analyze agency and non-agency mortgage-backed securities, as well as some related instruments, such as CDOs. We will discuss the key factors that drive default risk and interest rate risk on commercial and residential mortgages, and learn the basic principles for the valuation of mortgage-backed securities, taking into account the value of the prepayment option embedded in such securities. We will cover the historical development of mortgage secondary markets, the institutional structure of this sector (e.g. the role of Fannie Mae, Freddie Mac and Ginnie Mae), and the process of securitization. We will also discuss alternative funding sources to securitization, such as covered bonds, syndication, deposit finance and FHLB advances. We will also discuss the causes and consequences of the financial crisis, which has important implications for both commercial and residential real estate finance.

On the equity side, we will study Real Estate Investment Trusts (REITs), which are the primary traded equity structure used for real estate. This will include a discussion of the legal and institutional framework of the REIT industry, tax issues, and REIT valuation.

Since both debt and equity claims depend fundamentally on the value of the underlying real estate assets, we will also cover the measurement of real estate prices, recent market trends, fundamental determinants of prices, and valuation approaches.

We will also spend some time covering international aspects of real estate capital markets (e.g. covered bonds). Depending on time and class interests, we may also spend time covering other topics, such as real estate investment banking or Case-Shiller housing futures contracts.

Class time will be devoted to a mix of formal lectures, in-class exercises and guest lectures from Wall Street professionals. The course is a mix of qualitative and quantitative work. Students should expect to be doing a fair amount of cashflow modelling in Excel, as well as fixed income mathematics.

Prerequisites

The only formal pre-requisite for this course is Foundations of Finance.

Readings and Financial Calculator

Since most of the topics studied in the class are not well covered in any single text, there is no required textbook for the class. Primary materials for the course are the lecture notes, plus readings for each class that will be regularly posted on NYU Classes. Some of these readings will be required, others will be optional or background reading for interested students. (This will be made clear on Classes). Other class materials such as assignments, practice exams, course announcements and so on will also be posted on Classes.

Although you will not need to purchase a textbook, you are strongly encouraged to read two books that closely relate to the discussion in class, and which will be covered by assignment questions for extra credit. These books are available on Amazon and in bookstores.

Lewis, Michael, 1989, Liar's Poker, Penguin Books, NY, NY, ISBN 0-393-02750-3. The chapters most relevant to this course are Ch 5, 6 and 7 (these will be discussed in week 3), but the entire book is recommended. This book gives a clear, entertaining account of the birth of the mortgage-backed securities market.

McLean, Bethany, 2015, Shaky Ground: The Strange Saga of the U.S. Mortgage Giants, Columbia Global Reports, ISBN 978-0990976301. This short book (159 pp.) provides a vivid overview of the history and downfall of Fannie Mae and Freddie Mac, as well as recent developments (including high profile lawsuits by investors against the US government).

We will also make reference to three Harvard Business School cases during the course, which will be available to purchase in physical and electronic form from the NYU bookstore:

“Mortgage-Backs at Ticonderoga”, HBS Case 205-122, 2005. George Chacko, Peter Hecht,

Vincent Dessain, Anders Sjoman.

“Rosetree Mortgage Opportunity Fund”, HBS Case 9-209-088, 2009, Victoria Ivashina, Andre F. Perold.

“Cypress Sharpridge: Raising Capital in a Time of Crisis”, HBS Case 9-310-140, 2010, Lena G. Goldberg, Adam Nebesar.

Optional reading:

Although not required for the class, for those of you who are more technically inclined I would recommend:

Davidson and Levin, “Mortgage Valuation Models: Embedded Options, Risk, and Uncertainty”, ISBN 978-0-199-99816-6, Oxford University Press, 2014.

This book is a state-of-the-art reference on valuation methods for agency and non-agency MBS, emphasizing the relationship with the CAPM and arbitrage pricing theory.

Financial calculator:

A financial calculator will be required for the course and for exams, to perform basic annuity and present value type calculations. Any financial calculator will do, as long as you understand how to use it. However, I will be using a Texas Instruments: TI - BA II Plus, and will sometimes refer to it in class. [N.B. Students interested in obtaining CFA certification should note that the two approved calculators for CFA exams are the TI -BA II Plus, and the Hewlett Packard: HP 12C.]

Staying Up-to-Date

You are strongly encouraged to follow real estate finance news, broadly defined. If you encounter an interesting article that you would like to share with the class, please send me an email and I will post it on the class web site. A section of the NYUclasses site will be devoted to interesting background articles, and this section will be regularly updated during the semester.

Classroom Civility

Your behavior should respect your classmates desire to learn. Each lecture begins and ends exactly on time. I understand your busy schedules, but try not to come late. Because of the classroom layout, it is disruptive no matter how quiet you are. If you must miss a class or must come late, please let me know by email beforehand.

Laptop is allowed during class since we will be using some computer files during the lecture. While laptops have advantages in the classroom, they also have the potential to hamper your own learning experience as well as that of your neighbors. Please restrict your use to the software that we will be using and to the class materials.

The use of Blackberries, iPhones, iPads, cell phones, and similar devices is not allowed. Please turn them off before entering class. Do not engage in side conversations during the lecture. Repeated occurrence of such disruptions will be reflected in the final grade.

Grading and Assignments

The distribution of overall letter grades for the course will reflect Stern's guidelines. Your final course grade will be based on the following:

Assignments: 20% [dropping worst assignment grade]

Midterm quiz: 10% or 30%

Final exam: 60% or 40%.

Class attendance and participation: 10%

Note that there is some flexibility in the grading scheme, i.e. the balance between the midterm and final exam. Your midterm exam will be worth either 10% or 30% of your final grade, depending on how well you do in the midterm relative to the final. I'll correspondingly adjust the weight on the final exam (e.g. if your midterm weight is 30%, your final exam weight is 40%). This adjustment will be done automatically by me in a way that maximizes your overall grade. The intention here is to provide some insurance for you in case you "have a bad day" on the date of the midterm or the final exam.

There will be five assignments posted over the course of the semester. Your overall assignment grade will be based on the best four of your five individual assignments (i.e. you drop your worst score out of the five). You are encouraged, to complete these assignments in a group of up to three people, and submit a single group answer. When you submit your assignment online, please make sure you write the names of all the members of the group on the assignment. The assignments are due before class. Unless exceptional circumstances apply, late assignments will not be accepted. You are responsible if another member of your group fails to submit the assignment on time.

Honor Code

You are responsible for maintaining Stern's Honor Code which mandates zero tolerance for cheating and plagiarism. Violations of the honor code will be prosecuted with a minimum penalty of failure for the course, as required by code of conduct rules. If you become aware of any violations of the honor code you must take whatever steps are necessary to stop the violators. Per request of the dean, you must include a signed statement at the top of each problem set and exam, indicating that you adhere to the honor code. The statement is:

"I pledge my honor that I have not violated the Stern Honor Code in the completion of this exam/problem set." It is in your best interest that the market place knows that Stern takes honesty seriously; it adds to the value of your degree.

Class Schedule (Subject to change)

	Date	Material to be covered
1	5/16	<p>Introduction and real estate price dynamics</p> <ul style="list-style-type: none"> • Course outline and introduction • Measurement of commercial and residential property prices • Economic determinants of real estate prices
2	5/18	<p>Mortgages and mortgage calculations</p> <ul style="list-style-type: none"> • Primer on the US mortgage market • Structure of commercial and residential mortgage contracts • Mortgage mathematics (e.g. calculating points, NPV, prepayments etc.)
3*	5/23	<p>The mortgage finance system, and mortgage risks</p> <ul style="list-style-type: none"> • Securitization and the funding of residential and commercial mortgages • Passthrough securities versus collateralized mortgage obligations (CMOs) • The GSEs and the TBA market • Mortgage risks: (i) interest rate risk, (ii) credit risk, (iii) prepayment risk <p><i>*Assignment 1 Due before Class</i></p>
4	5/25	<p>Modelling prepayment risk</p> <ul style="list-style-type: none"> • Understanding prepayment risk • Modeling prepayment risk • Cash flow modeling of agency residential mortgage-backed securities (RMBS)
5*	6/1	<p>Mortgage valuation, and CMOs</p> <ul style="list-style-type: none"> • Estimating expected returns: static yield spreads and option adjusted spreads (OAS) • Understanding CMOs • Cashflow modeling of CMOs <p><u>HBS Case</u>: Mortgage Backs at Ticonderoga</p> <p><i>*Assignment 2 Due before Class</i></p>
6	6/6	<p>Midterm quiz (60 minutes, start of class)</p> <p>Guest Lecture: TBA</p>
7	6/8	<p>Modeling residential defaults, and the non-agency MBS market</p> <ul style="list-style-type: none"> • Non-agency market structuring (waterfalls etc.)

		<ul style="list-style-type: none"> • The subprime crisis • Government responses to the crisis <p><u>HBS Case</u>: Rosetree Mortgage Opportunity Fund</p>
8*	6/13	<p>Commercial real estate and commercial mortgages</p> <ul style="list-style-type: none"> • Introduction to commercial real estate • Structure and performance of commercial mortgages • Commercial Mortgage Backed Securities (CMBS) <p><i>*Assignment 3 Due before Class</i></p>
9	6/15	<p>REITs</p> <ul style="list-style-type: none"> • Introduction to Real Estate Investment Trusts (REITs) • REITs: Tax treatment other benefits • REIT valuation methods
10	6/20	<p>REITs (cont.)</p> <ul style="list-style-type: none"> • Non-traded REITs • Mortgage REITs <p><u>HBS Case</u>: Cypress Sharpridge: Raising Capital in a Time of Crisis <u>Guest Lecture</u>: TBA</p>
11*	6/22	<p>Innovations and derivatives in real estate capital markets</p> <ul style="list-style-type: none"> • Innovations and features of foreign markets • Covered bonds, real estate futures • CDOs, CDS and synthetic CDOs • Course review and Q&A <p><i>*Assignment 4 Due before Class</i></p>
12*	6/27	<p><u>Final exam [120 minutes]</u></p> <p><i>*Assignment 5 Due before Class</i></p>

Information about the MBA Real Estate Specialization

The Real Estate specialization at NYU Stern provides rigorous training in (i) the economics of real estate development and investment, the financing such projects, leasing, and appraisal of buildings, (ii) the pricing/valuation and trading of financial instruments with real estate as the underlying, such Real Estate Investment Trusts (REITS), residential and commercial mortgage-backed securities (MBS), and related derivative and structured finance products such as collateralized debt obligations (CDOs), credit default swaps (CDS), and index products (CDX, ABX, etc.), and (iii) the workings of real estate primary and secondary markets, including the various participants in these markets, their roles, and (iv) the legal, taxation, and regulatory environment. Elective courses can be chosen to emphasize the commercial real estate development process or the investment strategies in real estate capital markets. With an appropriate choice of elective courses, this track provides in-depth preparation for careers in real estate development, real estate brokerage, real estate project investment for private equity firms, family offices, sovereign wealth funds, and careers in real estate finance in the fixed income or equity desks of investment banks (research, sales & trading), hedge funds, and sovereign wealth funds.

*Real estate specialization courses: **three courses** among this list must be taken for the specialization (all courses are 3 unit courses):*

1. Real Estate Primary Markets (**FINC-GB.2329**, co-req: Corporate Finance [FINC-GB.2302](#))
2. Real Estate Capital Markets (**FINC-GB.2339**)
3. Real Estate Transactions (**BSPA-GB.2300**)
4. Real Estate Development and Entrepreneurship (**OPMG-GB.2360**)
5. Real Estate Investment Strategies (**FINC-GB.2341**)
6. Urban Systems (**ECON-GB.3375**)
7. Operations in Panama (**OPMG-GB.2312**)
8. Operations in Entertainment: Las Vegas (**OPMG-GB.2360**, with approved real estate project)
9. At most one course from the list of pre-approved non-Stern courses:
<http://www.stern.nyu.edu/AcademicAffairs/Specializations/RealEstate/index.htm>

Academic advisor for the real estate specialization: Prof. Stijn Van Nieuwerburgh