



SEMINAR IN REAL ESTATE FINANCE  
REAL ESTATE SECURITIES & INVESTMENTS

R E 388 – UNIQUE 03910

MW, 12:30 – 2:00, UTC 1.132

SPRING 2016

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<b>Office Hours</b>	after class MW: 2:00 – 3:00
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<b>Course Web Page</b>	via Canvas
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### Course Objectives

This course's primary objective is to examine real estate securities and real estate private equity investing. Students will learn about the various debt and equity securities available to investors, and will also learn about real estate private equity investing. Through lectures, readings, cases, and guest speakers, students will learn the benefits and risk of the various forms of investing in real estate securities and real estate private equity funds.

The course begins with a study of real estate debt markets and real estate debt securities, MBS (mortgage backed securities) and CMBS (commercial mortgage backed securities). The primary focus is on the structure and cash flow characteristics of real estate debt instruments. We start by studying the primary residential mortgage market and the mathematics and finance of residential mortgage cash flows and pricing. We then move into the secondary market for mortgage funds with a study of simple pass-through residential mortgage pass-through securities. The problems of prepayment and default and the complications that prepayment and default introduces to the valuation of mortgage backed securities is analyzed. The prepayment problem in simple residential mortgage pass-through securities drove structuring innovation in the early days of the market and the creation of Collateralized Mortgage Obligations (CMOs). Following our study of the prepayment problem we go directly to a study of the creation, structure, and pricing of CMOs, including a discussion of mortgage strip securities (IOs and POs), simple sequential tranching, and specialized CMO tranches including PACs and Zs. Students will analyze and model the tranches of an actual \$250 million Fannie Mae CMO (REMIC) as a case assignment. After our study of prepayment structuring in agency MBS, we will study tranching and securitization structures used in non-agency private label MBS. Private label MBS came to be dominated by subprime MBS, and we will spend considerable time studying the creation of subprime MBS, CDOs, and CDS, and the causes and catastrophes related to the subprime crisis. After working through the

residential mortgage instruments we will go directly into our study of Commercial Mortgage Backed Securities (CMBS). CMBS are very similar in spirit and structure to MBS, but significant differences in both prepayment and default characteristics make CMBS an interesting twist on the original MBS model.

The second half of the course is dedicated to the study of real estate equity markets and securities, both public and private. We will study how real estate fits within a diversified investor's portfolio, and the various alternatives an institutional investor has to invest in commercial real estate. We will spend several meetings discussing Real Estate Investment Trusts (REITs), including their structure, corporate governance, and valuation. We will also analyze alternative ways to invest in private equity in the real estate sector, such as commingled real estate funds and limited partnerships.

### Materials - books

Required:

Mortgage-Backed Securities, Second Edition, Fabozzi, Bhattacharya, and Berliner, 2011, Wiley.

Liar's Poker, by Michael Lewis, 1989 Penguin Books – *required reading for the quiz is chapters 5, 6, and 7. It's best to start with the last 6 paragraphs of chapter 4, when the mortgage desk is introduced.*

Optional source textbook for real estate finance in general (potentially useful or enlightening):

Real Estate Finance and Investments: Risk and Opportunities, Peter Linneman, Ph.D., Third Edition, 2011.

### Course Requirements and Grading

Grades will be based on the student's performance on one quiz (on Liar's Poker), two tests (debt test and equity test), and cases. The weights on each component of the overall course grade are as follows:

Class Participation	ongoing	5%
Liar's Poker Quiz	Wed, Feb 3	5%
CMO Case	Due Wed, Feb 17	20%
First half Debt test	Wed, Mar 2	30%
Lions Industrial Case	Date TBD	10%
Second half Equity test	Wed, May 6	30%

Make-up and extra-credit assignments are generally not possible. Your grade will be determined solely by the components listed above. If you fail to turn in the case assignment or the problem set when they are due you will not be able to make up the assignment or the points. Please don't miss the quiz or the tests.

## Schedule and Topics

MEETING	DAY	DATE	TOPIC	READING
1	Wed	Jan 20	Syllabus and course overview and description	
2	Mon	Jan 25	The Primary Mortgage Market – Players and Products, Mortgage Math	Fabozzi C1
3	Wed	Jan 27	Constructing RMBS, pooling mechanics, basic Ginnie pass-throughs - fixed income (FI) primer with a look at Duration and Convexity in basic FI and in MBS (the rub)	Fabozzi C2
4	Mon	Feb 1	Understanding and modeling prepayment and default risk – unscheduled payments	Fabozzi Cs 3 & 4
5	Wed	Feb 3	<b><i>Liar’s Poker quiz at beginning of class</i></b> Structuring around prepayment risk with IOs, POs, and basic sequential tranching in Agency RMBS. More advanced structuring including PACs and Zs.	Fabozzi Cs 5, 6, & 7
6	Mon	Feb 8	Finish RMBS Agency prepayment structuring <b><i>Assign and discuss CMO structuring case</i></b>	Fabozzi Cs 5, 6, & 7
7	Wed	Feb 10	Structuring Credit Risk in Private Label MBS Subprime mortgages, ABS, and CDOs	Fabozzi C8
8	Mon	Feb 15	Structuring Mortgage ABS (subprime credits), overview and history of subprime crisis and update on casualties (almost over, but not quite), post-crisis structures: CRT, SFR, and RPL/NPL bonds	Fabozzi C9
9	Wed	Feb 17	<b><i>CMO Structuring case DUE</i></b> CMBS – Intro, structure, market history and performance, call protection and calculations	
10	Mon	Feb 22	CMBS Analysis and Trading - Prof. Andreas Christopoulos in class speaking on CMBS, his time in the CMBS market, and his current research. <i>*this topic may switch with spreads on Wed Feb 24 – TBD.</i>	
11	Wed	Feb 24	Valuation and Analysis of MBS and CMBS - Yield Measures, Z-spreads, OAS analysis	Fabozzi Cs 10 & 11
12	Mon	Feb 29	Review/overview debt material	
13	Wed	Mar 2	<b>Midterm – Debt Test (in-class test)</b>	

*GLOBAL TRIP WEEK (March 7 - 11) and  
SPRING BREAK (March 14 - 19)*

MEETING	DAY	DATE	TOPIC	READING
15	Mon	Mar 21	Return and review debt test – final discussion of debt markets and debt securitization products	
16	Wed	Mar 23	Real Estate equity product overview – <ul style="list-style-type: none"> <li>• Public, liquid investment in REITs</li> <li>• Private Equity products and funds</li> <li>• A look at the accuracy of appraisals and public and private asset pricing</li> </ul>	
17	Mon	Mar 28	REITs – Industry overview, property types, return history, risk and return characteristics	
18	Wed	Mar 30	REITs – Valuation and analysis	
19	Mon	Apr 4	Managing against a Benchmark – managing a REIT portfolio against a publicly traded benchmark, and an extension of the idea to managing a private real estate portfolio against a private NCREIF benchmark	
20	Wed	Apr 6	Real Estate Capital Stack, including PE deal structures and equity sharing rules, <i>aka</i> cash flow waterfalls	
21	Mon	Apr 11	<b>Tim Berry, Pennybacker speaking on Real Estate PE</b>	
22	Wed	Apr 13	Real Estate in a Mixed Asset Institutional Portfolio – The use and effectiveness of real estate as a means of diversification and Sharpe ratio enhancement	
23	Mon	Apr 18	<b>Real Estate PE cap stack case: Lions Industrial Trust Work case in class with Joshua Brown, EVP at First Washington Realty; I-banker on this 2009 deal</b>	
24	Wed	Apr 20	Real Options in Real Estate – Thinking about the value of land and/or development projects in a useful real options framework	
25	Mon	Apr 25	<b>speaker TBD</b>	
26	Wed	Apr 27	<b>speakers Scott Dennis (Invesco) and Michael Dardick (Granite Properties)</b>	
27	Mon	May 2	Review/overview for equity test	
27	Wed	May 4	<b>Equity Test (in-class)</b>	

*This equity schedule is subject to change to accommodate the availability of guest speakers. I expect to get these speakers, and I know I will cover the topics listed, but I can't nail down exact dates until I have the speakers booked. Once I confirm speakers and dates I will get a finalized second-half schedule together.*

Notes on textbook reading, by chapter

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The Fabozzi mortgage book can get rather technical. I have reviewed it page-by-page, and below I have indicated required and optional or not-class-necessary topics covered in each chapter. I also indicate where my class notes will cover numerical examples presented in the book. By Chapter -

1. Read all of it.
2. Can leave out the structural detail in "MBS trading" pp 35-40.
3. Lots of numerical examples and industry terms that I will cover and include in the slides in class.
4. Easy chapter; read all of it.
5. Intro chapter to structuring mechanics; read all of it.
6. Read through the first sentence on page 121; 121-129 is pretty complicated and generally beyond the scope of what I'm trying to accomplish in this class. Likewise the example starting at the bottom of 134 through the end of the chapter is difficult and unnecessary for this class.
7. Read through the first half of page 147, so about the first 6 pages or so. The rest of the chapter covers interest securities such as floaters and inverse floaters and TTIBs, and that's a hard read that I can cover more easily in class, as time allows.
8. Read through the first half of page 176, ~ 10 pages. Beyond the heading "Private Label Senior Structuring Variations" is not necessary.
9. Read 193-202. The rest is honestly not bad, and discusses mortgage insurance and tranche-wrap products, but not necessary to read as I'll discuss both those products in class.
10. I like it, good fixed income finance. I'll do something very similar in class and you will be responsible for the classroom treatment, but not all the details contained in the textbook.
11. I like it, good fixed income finance. I'll do something very similar in class and you will be responsible for the classroom treatment, but not all the details contained in the textbook.
12. Long, detailed, example – we will not cover in this class.
13. Long, detailed, example – we will not cover in this class.