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Graduate School of Management  
CLAREMONT GRADUATE UNIVERSITY  
Claremont, CA 91711**

**MGT 475: SELECTED TOPICS IN FINANCE: FIXED INCOME  
Fall 2007  
Wednesdays 1:00-3:50pm**

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**Abstract**

This course teaches the valuation of bonds and the construction of various dynamic interest rate models, as well as the valuation of various related interest rate instruments. We'll present a broad range of debt instruments, such as Treasuries, corporate and municipal debt, mortgages (prime and sub-prime!), asset-backed debt securities, credit risk analysis and the valuation of interest rate and credit risk derivatives (futures, options, swaps). We also discuss active bond portfolio management, such as immunization, and bond indexing and portfolio performance analysis.

Considering that corporate investment projects (including M&A) are mostly financed with debt and that such credit is risky, this course is essential (and required) for any corporate manager, CFO, treasurer, venture capitalist and investment analyst, for example, for the interpretation of various spot and forward curves. After all, interest rate markets are very dynamic and interest rates change all the time, in reaction to both domestic and global corporate and political news, which also tends to continuously change credit ratings.

**Readings**

The basic textbook for this course is an old, trusted, very valuable, and now also newly updated reference, which is fairly non-technical and emphasizes the institutional and management aspects of bonds, bond markets and bond portfolios:

[F] Fabozzi, Frank, J. (2007), *Bond Markets, Analysis, and Strategies*, 6<sup>th</sup> ed., Pearson/Prentice Hall (ISBN: 0-13-198643-0).

However, because of the increased dynamism and volatility of the interest rate markets in the past 15 years, the latest theoretical and empirical developments, related to financial engineering, have taken place in dynamic interest rate modeling, primarily using the no-arbitrage (martingale) valuation approach. Therefore we must also have a serious look at the much more theoretical and technical:

[C] Cairns, Andrew J. G. (2004) *Interest Rate Models: An Introduction*, Princeton University Press (ISBN: 0-691-11894).

I advise you to purchase both these required texts.  
There is also a small course pack which students are expected to buy at Huntley Bookstore.

### **Software**

Most fixed income and interest rate models can easily be programmed in EXCEL spreadsheets, as is demonstrated in Part 1 “Bonds/Fixed Income Securities” of the highly recommended tutorial workbook of Craig Holden of the Kelley School of Business at Indiana University, which I also recommend you to purchase:

[H] Holden, Craig, W. (2004) *EXCEL Modeling in Investments*, 2<sup>nd</sup> ed., Prentice Hall, Upper Saddle River, NJ (ISBN: 0-13-142426-0).

It is a very valuable and highly recommended exercise to build your own spreadsheets, following Part 1 of Holden, while you work your way through this Fixed Income course, since you can use the computations for many of your other financial management courses! After all, bond pricing is the hard-core business of corporate fund-raising CFOs, treasurers, financial analysts, M&A experts, commercial bankers, credit analysts, and bond traders. But I will also demonstrate in class some software, originally developed at the Graduate School of Industrial Administration of Carnegie Mellon University for simulated debt trading, which can interact with standard spreadsheet packages, cf.:

O’Brien, John (1996) *Investments: A Visual Approach- Bond Valuation and Bond Tutor*, South-Western College Publishing (ISBN: 0-538-84811-1; pbk).

Unfortunately, it is no longer easily obtainable. But make an effort: it will be worth it!

### **Additional References**

I will hand out the first two chapters of my own book, since they contain some essential formulas, which you will repeatedly encounter in the construction of modern valuation models of various financial instruments (hand-out):

[L] Los, Cornelis A. (2001) *Computational Finance: A Scientific Perspective*, World Scientific Publishing, Singapore (ISBN: 981-02-4496-7, hbk; ISBN: 981-02-4497-5, pbk).

The first attempt to identify a dynamic model of interest rates close to empirical reality, is an historical curiosity:

Roll, Richard (1970) *The Behavior of Interest Rates: An Application of the Efficient Market Model to U.S. Treasury Bills*, Basic Books, Inc., New York, NY (SBN: 465-00597-7).

It contains an entertaining Foreword by Paul Samuelson about speculative markets.

I’m very fond of the compendium of interest rate models compiled by James and Webber, in particular, because they fortuitously compare the complete market/risk-neutral martingale paradigm with some of the alternative approaches, such as general equilibrium, price kernel and nonlinear, incomplete market/non-risk neutral models, of

both the descriptive and analytical kinds. It has been a great source for empirical research enthusiasts, like me:

James, Jessica, and Nick Webber (2000) *Interest Rate Modeling*, John Wiley & Sons (ISBN: 0-471-97523-0).

An alternative, fairly recent, compilation of dynamic interest rate models combining theory and empirical reality is:

Brigo, Damiano and Fabio Mercurio (2001) *Interest Rate Models: Theory and Practice*, Springer Verlag, Berlin (ISBN: 3-540-41772-9).

For a very recent volume showing some of the latest empirical research on a particular regional fixed income market, see the following volume by my friends Jonathan Batten of the Graduate School of Management at Macquarie University in Sydney, Australia and the late Ton Fetherston of the School of Business at the University of Alabama, as well as Professor Szilagyi of the Department of Finance at Tilburg University in The Netherlands:

Batten, J. A., T. A. Fetherston and P. G. Szilagyi (2006) *Japanese Fixed Income Markets: Money, Bond and Interest Rate Derivatives*, Elsevier, Amsterdam (ISBN: 0-444-52020-1).

### **Regular Testing**

I plan to use e-Instruction's Class Performance System (CPS) to start each class with a 5-10 minute multiple choice quiz, which is automatically scored, when you enter your answers with electronic responders.

### **Homework Assignments**

I will give you a few homework assignments chosen from the Exercises and Questions in F and C and on some articles in *The Wall Street Journal* (hand-outs), for which you have to build fixed income and interest rate models like in [H] and do computations.

### **Grading**

Your grades will be based on the regular CPS in-class tests (20%), a few homework assignments (10%), a Midterm Exam (35%) and a Final Exam (35%).

### **Website**

<http://www.sifma.org/>

This is the web site of the Securities Industry and Financial Markets Association (SIFMA). Its mission is "To champion policies and practices that benefit investors and issuers, expand and perfect global capital markets, and foster the development of new products and services. Fundamental to achieving this mission is earning, inspiring and upholding the public's trust in the industry and the markets." It has many interesting links and you can see the dynamic current US Treasury yield curve and compare it with its values of one week and a few weeks ago.

<b>CLASSES WEDNESDAY AFTERNOONS 1:00-3:50PM</b>	<b>TOPICS</b>	<b>READINGS &amp; ASSIGNMENT</b>
Sept 5	Introduction; valuation of bonds	F: Chapters 1-2 C: Chapter 1 L: Chapters 2-3 (hand-out)
Sept 12	Yield and term structure; interest rate risk; convexity and duration; immunization; arbitrage-free pricing and dynamic interest rate models	F: Chapters 3-5 C: Chapter 2 L: Chapter 11 (hand-out)
Sept 19	The all-important Treasuries; corporate and municipal debt; non-U.S. bonds; bond ratings, distressed debt; bond covenants	F: Chapters 6-9
Sept 26	Mortgages; mortgage backed securities; CMOs; sub-prime mortgages	F: Chapters 10-13, 18
Oct 3	Securitization and asset backed securities; CDOs	F: Chapters 14-15
Oct 10	<b>No Class</b>	
Oct 17	Embedded options; callable and puttable bonds; valuing convertibility	F: Chapters 17, 19
Oct 24	<b>MIDTERM EXAM</b>	
Oct 31	Dynamic interest rate models in discrete and continuous time	F: Chapter 16 C: Chapters 2-4
Nov 7	No-arbitrage interest rate models; fractal interest rate models	C: Chapters 5-6
Nov 14	Forward-measures; positive interest rates; market interest rate models	C: Chapters 7-9
Nov 21	Credit analysis; credit risk; active bond portfolio management	F: Chapters 20-22
Nov 28	Interest rate futures and options	F: Chapters 26-27
Dec 5	Interest rate swaps, caps and floors; credit derivatives	F: Chapters 28-29
Dec 12	Indexing; bond portfolio performance measurement and exact performance attribution analysis	F: Chapters 23, 25 L: Chapter 14 (hand-out)
Dec 19	<b>FINAL EXAM</b>	