

New York University Stern School of Business

B40.3333.60 Monday and Wednesday 6:00-9:00pm

**Debt Instruments and Markets**

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**Course Description:**

This course will be taught from the perspective of an institutional fixed income portfolio manager. There is a significant amount of creativity and discipline in designing portfolio strategies that satisfy the objectives of institutional clients and organizing an investment team to deliver superior performance relative to established benchmarks and competitors. This course will cover essentially the same topics as other sections of Debt Instruments and Markets at Stern. However, we take our motivation from the perspective of a portfolio manager who needs to understand how these standard topics impact investment choices and performance.

The prerequisite for this course is *B01.2311 Foundations of Finance*. It is assumed that students have a basic understanding of bond valuation, duration, convexity, portfolio theory, capital asset pricing models, option valuation and futures pricing. These prerequisites allow us to start from the perspective of a portfolio manager having clearly defined measures of performance and guideline restrictions. In this context, portfolio construction requires assessment of the relevant contributions that individual securities, sectors and hedge instruments make to the client's objective function and sizing the positions accordingly. Please review Chapters 1-10 of the textbook for much of the debt markets prerequisite material (definitions, analytics, and markets).

Textbook: Frank J. Fabozzi, Bond Markets, Analysis and Strategies, 7<sup>th</sup> Edition, Prentice Hall. (FF)

This course will include a combination of lectures and case discussions. The textbook, assigned readings and lecture material are all relevant to analyzing and solving the

cases. 60% of a student's grade will be a function of individual performance (4 short case write-ups and class participation – voluntary and cold calls). The remaining 40% of the grade will be based on group/team work (4 comprehensive group case write-ups and an evaluation by your team members). No in-class written exams/tests.

**Attendance is mandatory** for the following reasons. This course is designed to cumulate knowledge and apply it in subsequent classes and case applications. Students are certainly capable and expected to read and absorb the assigned materials on their own. The role of the Professor in class is to provide the bridge from theory to practice with investment technology and information about the business environment that is not readily available in textbooks. Furthermore, it should be obvious that a student cannot obtain a class participation grade without being in class.

FF in the outline below refers to the textbook and AR refers to additional readings or presentation materials. HBS cases are from the Harvard Business School and B&Y Cases are from Michael A. Berry and S. David Young, Managing Investments: A Case Approach, Dryden Press, 1990 (BY).

### Course Outline

#### I. May 17      Introduction

- FF, Chapter 23 Active Bond Portfolio Management Strategies
- FF, Chapter 24 Indexing
- AR, Replicating Bond Indices with Liquid Derivatives, JFI Spring 2006
  
- a. Bond Markets: Supply and Demand
- b. Fixed Income Benchmarks and Strategies
- c. Synthetic Benchmark Replication
- d. Active Portfolio Management
- e. Risk Dimensions of Fixed Income Securities

#### II. May 19      The Investment Process

- FF, Chapter 26 Bond Performance: Measurement and Evaluation
- AR, Portfolio Construction: Alphas, Betas, and Macro Factors
- AR, Performance Attribution and the Investment Management Process

III. May 24 Liability Driven Investments (LDI) for Pension Plans

FF, Chapter 25 Liability-Driven Strategies

AR, Managing Pension Liability Credit Risk: Maintaining a Total Portfolio Perspective, JPM Fall 2009

IV. May 26 **HBS Case: Pension Management at General Motors**

V. June 2 **HBS Case: Long-Term Capital Management, L.P. (A-D)**

VI. June 2&7 Prepayment Risk, Return, Valuation and Hedging

FF, Chapter 11 Agency Mortgage Pass-Through Securities

FF, Chapter 12 Agency Collateralized Mortgage Obligations and Stripped Mortgage-Backed Securities

FF, Chapter 17 Interest-Rate Models

FF, Chapter 19 Analysis of Residential Mortgage-Backed Securities

FF, Chapter 27 Interest-Rate Futures Contracts

FF, Chapter 28 Interest-Rate Swaps, Caps, and Floors

AR, Time-Varying Empirical Duration and Slope Effects for Mortgage-Backed Securities, JFI September 1998

AR, Key Rate Durations: Measures of Interest Rate Risks, JFI Sept 1992

AR, An Introduction to CMO Residuals

a. Agency MBS Structure

i. Securitized Pools of Home Mortgages

ii. Interest Only and Principal Only Strips

iii. Collateralized Mortgage Obligations (CMOs)

iv. CMO Residuals

b. Valuation of Agency MBS

i. Interest Rate Process

ii. Prepayment Model

iii. Option-Adjusted Spread to Libor (OASL)

iv. Relative Value Trades

c. Risk Management

i. Effective Duration, Slope, Volatility, Swap Spread, Prepayments

ii. Static and Dynamic Hedging

VII. June 9 **B&Y Case: Hedging Mortgage-Back Securities**  
**HBS Case: Harrington Financial Group**

FF, Chapter 13 Nonagency Residential Mortgage-Backed Securities  
AR, The ABCs of HELs, JFI June 2005  
AR, Modeling of Mortgage Defaults, JFI Spring 2008  
AR, A Loss Severity Model for Residential Mortgages, JFI Fall 2008  
FF, Chapter 14 Commercial Mortgage Loans and Commercial Mortgage  
Backed Securities (CMBS)  
AR, Commercial Mortgage Default and Refinancing Risk: A Primer, JPM  
Special Real Estate Issue 2009

- a. Valuation of Non-Agency Residential MBS
  - i. Interest Rate and Home Price Processes
  - ii. Prepayment, Delinquency, Default and Loss Severity Models
  - iii. Credit Option-Adjusted Spread to Libor (COASL)
  - iv. Relative Value Trading Strategies
  - v. Risk Management
- b. Commercial Mortgage Backed Securities

VIII. June 14 **HBS Case: Smith Breeden Assoc: The Equity Plus Fund (A&B)**

More on Mortgage Derivatives

FF, Chapter 16 Collateralized Debt Obligations

- a. Collateralized Debt Obligations
- b. Residential Mortgage Credit Default Swaps
- c. ABX and CMBX Indices

IX. June 16 **HBS Case: Rosetree Mortgage Opportunity Fund**

X. June 21 Corporate Credit Risk, Return, Valuation and Hedging

FF, Chapter 21 Corporate Bond Credit Analysis  
FF, Chapter 22 Credit Risk Modeling  
AR, Empirical Duration of Corporate Bonds and Credit Market Segmentation,

JFI Summer 2010

- a. Valuation
  - i. Reduced Form Models
  - ii. Structural Models
  - iii. Interest Rate and Firm Value Processes
  - iv. Default and Loss Severity
  - v. Credit Option-Adjusted Spread to Libor (COASL)
- b. Risk Management
  - i. Effective Duration, Slope, Volatility, Swap Spread, Default
  - ii. Credit Default Swaps and CDX Indices
- c. Corporate Bond Portfolio Strategies and Performance

XI. June 23 Callable Convertible Corporate Bonds

FF, Chapter 18 Analysis of Bonds with Embedded Options

FF, Chapter 20 Analysis of Convertible Bonds

**B&Y Case: A Tale of Two Models (A and B)**

XII. June 28 Credit Derivative Strategies

FF, Chapter 30 Credit Derivatives

**HBS Case: Delphi Corp. and the Credit Derivatives Market (A)**