IIT ROORKEE

NPTEL ONLINE CERTIFICATION COURSE

QUANTITATIVE INVESTMENT MANAGEMENT

LECTURE 1

Overview & Introduction, Debt & Equity

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SCOPE & PROPOSED COVERAGE

- **FIXED INCOME SECURITIES**
- Valuation of bonds
- Interest Rate & Yield Curve Dynamics
- Interest Rate Risk
- Fixed Income Portfolio Management
- **FINANCIAL DERIVATIVES**
- Features & Applications
- Role of derivatives in portfolio management
- **EQUITY SECURITIES**
- Mean Variance Optimization
- Factor Models, CAPM & APT
- Equity Portfolio Management

RELEVANCE

- MBA elective in the finance stream,
- Chartered Financial Analysts (CFA) Program,
- Chartered Accountancy, Cost Accountancy, Company Secretaryship,
- Undergraduate & graduate courses in Commerce & Management.

RECOGNITION OF THE COURSE

- Financial services industry including:
- Banks,
- Stock & commodity exchanges,
- Stock brokers,
- Portfolio managers,
- Investment bankers,
- Market regulators etc.

RECOMMENDED READINGS & VIDEOS

- **Introduction to Fixed Income Analysis, Frank J Fabozzi & Steven V Mann**
- **Quantitative Equity Investing, Frank J Fabozzi, Sergio M Focardi & Petter N Kolm**
- **Options, Futures & Other Derivatives, John C Hull**
- **Security Analysis & Portfolio Management, NPTEL, Course Website:** NPTEL :: Management - NOC:Security Analysis & Portfolio Management
- **Financial Derivatives & Risk Management, NPTEL, Course Website:** NPTEL :: Management - NOC:Financial Derivatives & Risk Management

USP OF THIS COURSE

- Holistic concept-based package backed up with
- mathematical validation,
- extensive PPTs,
- supplementary notes,
- assignments &
- work through problems.

STRUCTURE

- Conventional NPTEL structure with:
- 30 lecture hours over 12 weeks;
- Weekly assignments;
- Final exam.

TENTATIVE COURSE PLAN

- **Lecture 1:** Overview & Introduction
- **Lecture 2:** Risk & Arbitrage
- **Lectures 3 -10:** Bond Pricing, Interest Rate Risk, Yield Curve Analytics, Fixed Income Portfolio Management
- **Lectures 11-22:** Basics & Applications of Derivatives
- **Lectures 23-30:** MVPO, Factor Models, CAPM & APT, Equity Portfolio Management

WHAT IS A SECURITY?

- A tradeable financial instrument is usually termed as a security.
- For the purposes of analysis, a security constitutes a point in risk-return space.
- What can and can't be called a security also depends on the relevant legal environment.

SECURITIES UNDER SCRA, 1956

- “securities” include—
- (i) shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or other body corporate;
- (ia) derivative;
- (ib) units or any other instrument issued by any collective investment scheme to the investors in such schemes;

- **(id) units or any other such instrument issued to the investors under any mutual fund scheme;**
- **(ii) Government securities;**
- **(iia) such other instruments as may be declared by the Central Government to be securities; and**
- **(iii) rights or interest in securities**

CLASSIFICATION OF SECURITIES

- Debt
- Equity
- Hybrid
- Derivatives

DEBT SECURITIES

- Debt securities are securities issued under a contract of borrowing of money by the issuer.
- These securities embed a promise of repayment of amount borrowed plus interest for the period of borrowing.
- Bonds, debentures, commercial paper, treasury bonds, promissory notes and treasury bills are all examples of debt securities.

- The agreement under which such securities are issued is called the indenture.
- The terms of the indenture include
- details of the borrowing,
- repayment terms,
- interest (rate & computation);
- other features of the security e.g., convertibility, indexation etc.
- covenants to be followed by the borrower.

EQUITY SECURITIES

- Equity refers to a share of ownership in a company.
- Equity holding usually generates earnings in the form of dividends.
- Prices of traded equity change frequently giving rise to capital gains and losses.
- Thus, return from investment in traded equity comprises primarily of capital gains/losses.

DEBT VS EQUITY: PHILOSOPHICAL ISSUES

- Equity implies ownership.
- Equity takes substantive business risk.
- Concept of limited liability.

- In debt, credit risk is paramount.
- Debt is more risky for borrower, less for lender compared to equity.
- Borrowing leads to monitoring by lenders through nominee directors or covenants.
- DEBT->ENCUMBRANCES->SUB-OPTIMAL DECISONS (AGENCY COSTS)

DEBT VS EQUITY: TECHNICAL ISSUES

- Interest is fixed rate, dividend is discretionary.
- Interest is a charge, dividend is appropriation.
- Tax treatment differs. Interest is tax deductible, not dividend. Why?
- INTEREST TAX SHIELD

- **Because debt is less risky for the lender, it is usually available at a cheaper rate compared to equity.**
- **Interest tax shield further reduces the cost of debt.**
- **Leverage by way of replacing equity by debt simply magnifies the earnings irrespective of whether they are positive or negative.**
- **Thus, excessive leverage results in escalating the risk profile of the borrowing entity.**