

# CANDIDATE BODY OF KNOWLEDGE™

The CFA curriculum is grounded in the practice of the investment profession. CFA Institute periodically conducts a job analysis involving CFA charterholders around the world to determine those elements of the body of investment knowledge and skills that are important to charterholders in their practice. The most recent job analysis was completed in 2001. The survey results define the Candidate Body of Knowledge (CBOK™) and to determine how much emphasis each of the major topic areas receives on the CFA examinations.

The CBOK is organized into four major topic areas: ethical and professional standards, tools and inputs for investment valuation and management, asset valuation, and portfolio management and performance presentation.

Two features of the CBOK are especially relevant to the CFA examinations. First, the curriculum for each level of the CFA Program is organized primarily around a functional area:

The *Level I* study program emphasizes tools and inputs and includes an introduction to asset valuation and portfolio management techniques.

The *Level II* study program emphasizes asset valuation and includes applications of the tools and inputs (including economics, financial statement analysis, and quantitative methods) in asset valuation.

The *Level III* study program emphasizes portfolio management and includes strategies for applying the tools, inputs, and asset valuation models in managing equity, fixed income, and derivative investments for individuals and institutions.

Second, because they are an integral part of the other three functional areas of investment management, ethical and professional standards are covered at all three levels of the curriculum.

## CFA® CANDIDATE BODY OF KNOWLEDGE

Revised 2001

### I. ETHICAL AND PROFESSIONAL STANDARDS

#### A. Professional Standards of Practice

1. The Code of Ethics
2. Standards of Professional Conduct
  - a. Standard I: Fundamental responsibilities
  - b. Standard II: Relationships with and responsibilities to the profession
    - (1) Use of professional designation
    - (2) Professional misconduct
    - (3) Prohibition against plagiarism
  - c. Standard III: Relationships with and responsibilities to the employer

- (1) Obligation to inform employer of code and standards
- (2) Duty to employer
- (3) Disclosure of conflicts to employer
- (4) Disclosure of additional compensation arrangements
- (5) Responsibilities of supervisors
- d. Standard IV: Relationships with and responsibilities to clients and prospects
  - (1) Reasonable basis and representations
  - (2) Research reports
  - (3) Independence and objectivity
  - (4) Fiduciary duties
  - (5) Portfolio investment recommendations and actions
  - (6) Fair dealing
  - (7) Priority of transactions
  - (8) Preservation of confidentiality
  - (9) Prohibition against misrepresentation
  - (10) Disclosure of conflicts to clients and prospects
  - (11) Disclosure of referral fees
- e. Standard V: Relationships with and responsibilities to the investing public
  - (1) Prohibition against use of material nonpublic information
  - (2) Performance presentation
- 3. Disciplinary sanctions for violations
- B. Topical Issues
  - 1. Corporate governance
  - 2. Soft dollar standards
  - 3. Fiduciary duty
  - 4. Insider trading
    - a. Mosaic Theory
    - b. Selective disclosure vs. full disclosure
  - 5. Personal investing

## II. QUANTITATIVE METHODS

- A. Time Value of Money
  - 1. Future value of a single cash flow
    - a. Calculating the future value of a single cash flow
    - b. Frequency of compounding
    - c. Continuous compounding
    - d. Annual and effective interest rates
  - 2. Future value of a series of cash flows
    - a. Equal cash flows
      - (1) Ordinary annuity
      - (2) Annuity due
    - b. Unequal cash flows
  - 3. Present value of a single cash flow
    - a. Calculating the present value of a single cash flow
    - b. Frequency of compounding
  - 4. Present value of a series of cash flows
    - a. Calculating the present value of a series of equal cash flows

- (1) Ordinary annuity
    - (2) Annuity due
  - b. Present value of a series of unequal cash flows
  - c. Present value of an infinite series of equal cash flows (perpetuity)
- 5. Equivalence of present and future value
- 6. Other applications of the time value of money
  - a. Solving for interest rates and growth rates
  - b. Solving for the number of periods
  - c. Solving for the size of annuity payments
- 7. Discounted cash flow analysis
  - a. Net present value rule
  - b. Internal rate of return rule
  - c. Problems with the internal rate of return rule
- 8. Simple interest and money-market conventions
  - a. Bank-discount yield
  - b. Periodic yield
  - c. Bond-equivalent yield
  - d. Effective annual yield
  - e. CD-equivalent yield
- 9. Investment measures of return
  - a. Dollar-weighted rate of return
  - b. Time-weighted rate of return
- B. Basic Statistical Concepts
  - 1. Nature of statistics
    - a. Populations and samples
    - b. Types of statistical data
      - (1) Nominal data
      - (2) Ordinal data
      - (3) Interval data
      - (4) Ratio data
  - 2. Frequency distributions
  - 3. Measures of central tendency
    - a. Population mean
    - b. Sample mean
    - c. Median
    - d. Mode
    - e. Quartiles, quintiles, deciles, and percentiles
    - f. Weighted mean
    - g. Geometric mean
      - (1) Geometric mean return
      - (2) Relationship to arithmetic mean return
  - 4. Measures of dispersion
    - a. Measures of absolute dispersion
      - (1) Range
      - (2) Mean absolute deviation
      - (3) Variance and standard deviation

- (a) Population variance and standard deviation
    - (b) Sample variance and standard deviation
  - b. Relative dispersion
- 5. Measures of skewness
- 6. Measures of kurtosis
- C. Probability Concepts and Random Variables
  - 1. Probability concepts
    - a. Definitions, including outcome, event, sample space, and mutually exclusive
    - b. Objective probability
      - (1) Classical probability
      - (2) Empirical concept
      - (3) Subjective probability
  - 2. Methods of counting
    - a. Multiplication rule of counting
    - b. Factorial rule
    - c. Permutation rule
    - d. Combination rule
  - 3. Random variables and probability
    - a. Random variable
    - b. Univariate probability distribution
    - c. Discrete versus continuous random variables
    - d. Probability density function
    - e. Cumulative density function
  - 4. Probability theorems/axioms
    - a. The complement rule
    - b. The special rule of addition
    - c. General rule of addition
    - d. Rule of multiplication
      - (1) Independent events
      - (2) Dependent events
      - (3) Decision trees
      - (4) Bayes' Theorem
  - 5. Expected value, variance, and covariance/correlation
    - a. Expected value
      - (1) Random variable
      - (2) Constant times a random variable
      - (3) Sum of random variables
      - (4) Weighted sum
    - b. Multivariate probability distribution
    - c. Variance
      - (1) Random variable
      - (2) Constant times a random variable
      - (3) Random variable plus a constant
    - d. Covariance
      - (1) Between two random variables
      - (2) Constant times a random variable

- e. Correlation coefficient between two random variables
  - f. Covariance among more than two random variables
- 6. Standardized random variables
- D. Common Probability Distributions
  - 1. Discrete random variables
    - a. Discrete uniform distribution
    - b. Binomial distribution
    - c. Expected value and variance of a binomial random variable
  - 2. Continuous probability distributions
    - a. Uniform distribution
    - b. Normal distribution
    - c. Standard normal distribution
    - d. Cumulative density for the standard normal distribution
    - e. Finding standard normal distribution areas
    - f. Confidence intervals
    - g. Mean-variance portfolio selection
    - h. Monte Carlo simulation
  - 3. Lognormal distribution
    - a. Lognormal stock prices
    - b. Price relatives
- E. Sampling and Estimation
  - 1. Random samples
    - a. Sampling in investment analysis
    - b. Time series and cross-sectional data
    - c. Data-snooping bias
    - d. Sample selection bias
      - (1) Survivorship bias
      - (2) Delisting bias
  - 2. Distribution of the sample mean
  - 3. Point and interval estimates of the population mean
    - a. Point estimators
    - b. Confidence intervals when sampling from a normal distribution with known variance
    - c. Confidence intervals when sampling from a normal distribution with unknown variance
    - d. Using  $t$  distribution tables
    - e. Confidence intervals when sampling from a non-normal population
- F. Statistical Inference and Hypothesis Testing
  - 1. Establishing hypotheses
    - a. Null hypothesis
    - b. Alternative hypothesis
  - 2. Testing hypotheses
    - a. Test criterion
    - b. Two-tail tests
    - c. One-tail tests
    - d. Type I error (rejecting a true null hypothesis)

- e. Type II error (failing to reject a false null hypothesis)
- 3. Types of hypothesis testing
  - a. Testing the mean of a single sample when the population standard deviation is not known
  - b. Testing the difference between the population means of two samples
    - (1) Population variances are known
    - (2) Population variances are not known but assumed equal
    - (3) Dependent samples: paired data
  - c. Testing the proportion of a single sample: significance tests with small samples
  - d. Significance tests and confidence intervals for a single variance
    - (1) Confidence interval for the sample variance
    - (2) Hypothesis test about a single population variance
    - (3) Testing the equality of two variances: the F-distribution
- 4. Analysis of variance (ANOVA)
  - a. Single-Factor analysis of variance
  - b. F-test for equality of factor-level means
  - c. Computing sums of squares
  - d. Degrees of freedom
- G. Correlation Analysis and Linear Regression
  - 1. Correlation analysis
    - a. Scatter plots and correlation analysis
    - b. Computing the correlation coefficient
    - c. Testing the significance of the correlation coefficient
  - 2. Linear regression
    - a. Linear regression with one independent variable
    - b. Assumptions of the linear regression model
    - c. Standard error of estimate
    - d. Coefficient of determination
    - e. Confidence intervals and testing hypotheses
      - (1) Significance level
      - (2) Standard error of the estimated coefficient
      - (3) Critical value for rejecting the null hypothesis
    - f. Prediction intervals
    - g. Limitations to regression analysis
- H. Multivariate Regression
  - 1. Multiple linear regression
    - a. Assumptions of the multiple linear regression model
    - b. Standard error of estimate in multiple linear regression
    - c. Predicting the dependent variable in a multiple regression model
    - d. Testing whether all the regression coefficients are equal to zero
  - 2. Using dummy variables in regressions
  - 3. Heteroskedasticity
    - a. Types of heteroskedasticity
    - b. Tests that evaluate heteroskedasticity
    - c. Correcting for heteroskedasticity
  - 4. Serial correlation and Durbin-Watson test

- a. Consequences of serial correlation
  - b. Durbin-Watson statistic to test for serial correlation
  - c. Correcting for serial correlation
  - d. Generalized least squares
- 5. Multicollinearity
- 6. Models with qualitative dependent variables
- I. Time Series Analysis
  - 1. Trends
  - 2. Limitations to trends
  - 3. Fundamental issues in time series
  - 4. Autoregressive time series models
    - a. Mean reversion
    - b. Multiperiod forecasts
    - c. Instability of regression coefficients
  - 5. Random walks and unit roots
  - 6. Moving-average time series models
    - a. Smoothing past values with a moving average
    - b. Moving average models for forecasting
  - 7. Seasonality in time-series models
- J. Portfolio Concepts
  - 1. Optimal portfolios with three assets
  - 2. Minimum Variance Frontier for many assets
  - 3. Instability in the Minimum Variance Frontier
  - 4. Diversification and portfolio size
  - 5. Risk free assets and the trade-off between risk and return
  - 6. The Capital Allocation Line
  - 7. The Capital Asset Pricing Model (CAPM)
  - 8. Estimates based on historical means, variances and covariances
  - 9. The Market Model
  - 10. Adjusted-beta Market Models
  - 11. The structure of factor models
  - 12. Arbitrage Pricing Theory (APT) and the factor model
  - 13. Multifactor models in current practice

### **III. ECONOMICS**

- A. Market Forces of Supply and Demand
  - 1. Determinants of individual demand
  - 2. Determinants of individual supply
  - 3. Equilibrium price
  - 4. Analyzing changes in equilibrium
  - 5. How prices allocate resources
- B. Elasticity
  - 1. Determinants of price elasticity of demand
  - 2. Determinants of price elasticity of supply
  - 3. Microeconomic government policies
  - 4. Analysis of price ceilings
  - 5. Analysis of price floors

6. Tax incidence
7. Market efficiency
- C. The Firm and Industry Organization
  1. Organization of the business firm
    - a. Basic types of business firms
    - b. The principal-agent problem
  2. Costs of production
    - a. Opportunity cost, explicit cost, and implicit cost
    - b. Accounting cost versus opportunity cost
    - c. The production function
    - d. Fixed and variable costs
    - e. Average and marginal cost
    - f. Cost curves and their shapes
    - g. Diminishing returns and cost curves
    - h. Output and costs in the long run
  3. Firms in competitive markets
    - a. Definition of competition
    - b. Revenue of a competitive firm
    - c. Profit maximization for the competitive firm
    - d. Accounting profit and economic profit
    - e. The competitive firm's supply curve
    - f. The supply curve in a competitive market
  4. Monopoly
    - a. Barriers to entry (e.g., economics of scale, government licensing, patents, control of essential resources)
    - b. How monopolies make production and pricing decisions
    - c. Public policy and monopolies
  5. Oligopoly
    - a. Duopoly
    - b. Equilibrium for an oligopoly
    - c. Game theory and the economics of cooperation
    - d. Public policy when entry barriers are high
  6. Monopolistic competition
    - a. Price and output in competitive markets with differentiated products
    - b. Allocative efficiency in monopolistic competition
- D. Supply and Demand for Productive Resources
  1. Demand for resources
    - a. Marginal productivity and the firm's hiring decision
    - b. Supply, demand, and resource prices
  2. Capital markets
    - a. Interest rates
    - b. Determination of interest rates
    - c. Money rate versus real rate of interest
    - d. Interest rates and risk
- E. Measuring National Income
  1. Gross Domestic Product (GDP)

2. Components of GDP
3. Real versus nominal GDP
  - a. GDP deflator
  - b. Using the GDP deflator to derive real GDP
  - c. The consumer price index
4. Problems with GDP as a measure of national product
- F. Economic Fluctuations and Unemployment
  1. Descriptive terms in business cycle analysis
  2. Index of leading economic indicators
  3. Types of unemployment
  4. Problems of measuring unemployment
- G. The Monetary System
  1. Role of a central bank
  2. Tools of monetary control
    - a. Open-market operations
    - b. Reserve requirements
    - c. Discount rate
- H. Inflation: Causes and Consequences
  1. Causes of inflation
  2. Quantity theory of money
  3. Equation of exchange
  4. Deflation/stagflation
- I. International Trade
  1. Gains from specialization and trade
  2. Economics of trade restrictions
    - a. Economics of tariffs
    - b. Economics of quotas
    - c. Other nontariff barriers to trade
    - d. Exchange-rate controls as a trade restriction
- J. International Finance
  1. Foreign exchange market
    - a. Organization of the foreign exchange market
    - b. The spot market
    - c. The forward market
    - d. Interest rate parity theory
  2. Determination of exchange rates
    - a. Nominal exchange rates
    - b. Real exchange rates
    - c. Purchasing-power parity
  3. Balance of payments
    - a. Current-account transactions
    - b. Capital-account transactions
    - c. Official reserve account
- K. The Macroeconomics of an Open Economy
  1. Supply and demand for loanable funds and for foreign-currency exchange
    - a. The market for loanable funds

- b. The market for foreign-currency exchange
  - 2. Equilibrium in the open economy
    - a. Net foreign investment flows
    - b. Government budget deficits
    - c. Trade policy
    - d. Political instability and capital flight
- L. Aggregate Demand and Aggregate Supply
  - 1. The aggregate demand curve
    - a. Reasons for downward sloping aggregate demand curve (e.g., wealth effect, interest rate effect, exchange rate effect)
    - b. Shifts in the aggregate demand curve
  - 2. The aggregate supply curve
    - a. Short-run aggregate supply curve
    - b. Long-run aggregate supply curve
    - c. Shifts in the short-run aggregate supply curve
  - 3. The influence of monetary policy on aggregate demand
    - a. Money supply and money demand
    - b. Transmission of monetary policy
    - c. Unanticipated expansionary monetary policy
    - d. Unanticipated restrictive monetary policy
    - e. Timing of monetary policy
    - f. Anticipated monetary policy
  - 4. The influence of fiscal policy on aggregate demand
    - a. Fiscal policy and the crowding-out effect
    - b. Problems of proper timing of fiscal policy
    - c. Fiscal policy as a stabilization tool
    - d. Supply-side effects of fiscal policy
  - 5. Expectations and economic policy
    - a. Adaptive expectations hypothesis
    - b. Rational expectations hypothesis
    - c. The differences between adaptive and rational expectations
    - d. The implications of adaptive and rational expectations
    - e. Activist versus nonactivist stabilization policy
- M. Sources of Economic Growth
  - 1. Physical capital
  - 2. Human capital
  - 3. Technological progress
  - 4. Institutional environment (e.g., property rights, political stability, competitive markets, stable money and price, an open economy, moderate marginal tax rates)
- N. Government Regulation
  - 1. Regulation of business
  - 2. Costs of regulation

O. Natural Resource Markets

P. Relationship of Economic Activity to the Investment Process

#### **IV. FINANCIAL STATEMENT ANALYSIS**

A. Financial Reporting System

1. General concepts and rules
2. U.S. Generally Accepted Accounting Principles (GAAP)
3. International Accounting Standards (IAS)

B. Principal Financial Statements

1. Balance sheet
  - a. Format and classification (e.g., assets, liabilities, stockholders' equity)
  - b. Measurement of assets and liabilities
  - c. Uses of the balance sheet
2. Income statement
  - a. Format and classification
  - b. The accrual concept of income
  - c. Revenue and expense recognition
    - (1) General principles
    - (2) Percentage-of-completion method
    - (3) Completed contract method
    - (4) Installment method
    - (5) Cost recovery method
  - d. Nonrecurring items (e.g., extraordinary items, unusual items, restructuring charges, discontinued operations, changes in accounting standards, disclosure of nonrecurring items, analysis of nonrecurring items)
  - e. Earnings quality
  - f. Earnings per share
3. Statement of cash flows
  - a. Direct and indirect method cash flow statements
  - b. Preparing a direct method statement of cash flows (e.g., cash flow from operations, investing cash flow, financing cash flow)
  - c. Indirect method
  - d. Reported versus observed changes in assets and liabilities (e.g., acquisitions and divestitures, translation of foreign subsidiaries)
  - e. Analysis of cash flow information
4. Statement of stockholders' equity
  - a. Format, classification, and uses
  - b. Other comprehensive income
5. Other sources of financial information
  - a. Letter to shareholders
  - b. Footnotes
  - c. Management discussion and analysis
  - d. Segment/disaggregated information
  - e. Operating and performance data
  - f. Forward looking information/plans
  - g. Role of the auditor
  - h. Annual report to regulators (e.g., Form 10K in U.S.)

- i. Proxy statement
  - j. Change in material status report (e.g., Form 8K in U.S.)
  - k. Quarterly reports
  - l. News releases
- C. Earnings Quality and Nonrecurring Items
- 1. Earnings quality
    - a. Stock options
    - b. Revenue recognition
    - c. Assumptions
    - d. Reserves
  - 2. Nonrecurring items
    - a. Extraordinary items
    - b. Restructuring charges
    - c. Unusual items
- D. Analysis of Inventories
- 1. Relationship between inventory and cost of goods sold
    - a. Stable prices
    - b. Rising prices
  - 2. Inventory methods
    - a. Specific identification
    - b. First-in, first-out (FIFO)
    - c. Average cost
    - d. Last-in, first-out (LIFO)
    - e. Adjustment from LIFO to FIFO
      - (1) Adjustment of inventory balances
      - (2) Adjustment of cost of goods sold
    - f. Adjustment of income to current cost income
    - g. Effect of LIFO/FIFO choice on financial ratios (e.g., profitability, liquidity, activity, solvency)
    - h. Analysis implications of changes to and from LIFO
    - i. Comparison of companies using different inventory valuation methods
    - j. International comparisons of inventory accounting methods
- E. Analysis of Long-Lived Assets
- 1. Capitalization versus expensing
    - a. Financial statement effects of capitalization (e.g., income variability, profitability, cash flow from operations, leverage ratios)
    - b. Capitalization of interest costs
    - c. Intangible assets (e.g., research and development, patents and copyrights, franchises and licenses, brands and trademarks, goodwill)
    - d. Asset revaluation
    - e. International differences
    - f. Adjustments for capitalization and expensing
    - g. Need for analytic adjustments
  - 2. Depreciation methods
    - a. Alternatives (e.g., annuity or sinking fund depreciation, straight line depreciation, accelerated depreciation)

- b. Depletion
- c. Amortization
- d. Depreciation method disclosures
- e. Impact of depreciation methods on financial statements
- f. Accelerated depreciation and taxes
- g. Impact of inflation on depreciation
- h. Changes in depreciation method
- 3. Analysis of fixed asset disclosures
- 4. Impairment of long-lived assets
- 5. Retirement of long-term assets
- 6. Liabilities for closure and environmental costs
- F. Analysis of Income Taxes
  - 1. Issues in tax and financial reporting
  - 2. Deferred tax assets and liabilities
    - a. Accounting for deferred taxes
    - b. Analysis of deferred tax assets
    - c. Non-U.S. financial reporting (e.g., IASC standards)
- G. Analysis of Financing Liabilities
  - 1. Analysis of balance sheet debt
    - a. Analysis of current liabilities
    - b. Analysis of long-term debt
    - c. Analysis of debt with equity features (e.g., convertible bonds, warrants, commodity bonds, perpetual debt, preferred stock)
    - d. Analysis of changes in interest rates (e.g., estimating the market value of a firm's debt)
    - e. Retirement of debt prior to maturity
  - 2. Bond covenants
  - 3. International accounting and reporting practices for balance sheet debt
- H. Analysis of Leases
  - 1. Incentives for leasing
  - 2. Lease classification issues from lessee perspective (e.g., capital lease, operating lease)
  - 3. Financial reporting by lessees
  - 4. Financial reporting by lessors
  - 5. Financial reporting for sales with leasebacks
- I. Analysis of Off-Balance-Sheet Assets and Liabilities
  - 1. Disclosure of off-balance-sheet assets
  - 2. Disclosure of off-balance-sheet liabilities
  - 3. Take-or-pay and throughput arrangements
  - 4. Sale of receivables
  - 5. Finance subsidiaries
  - 6. Joint ventures and investment in affiliates
- J. Analysis of Pensions, Stock Compensation, and Other Employee Benefits
  - 1. Disclosures
    - a. Components of pension cost
    - b. Plan status
    - c. Reconciliation

- d. Assumptions used to calculate pension cost and obligations
- 2. Analysis of pension costs and liability
  - a. Importance of assumptions
    - (1) Factors affecting benefit obligations (e.g., service cost, interest cost, actuarial gains and losses, prior service cost from plan amendments, benefits paid)
    - (2) Factors affecting plan assets (e.g., employer contribution, return on assets, benefits paid)
    - (3) Factors affecting pension expense (e.g., service cost and interest cost, expected return on assets, amortization of gains or losses, amortization of prior service cost, amortization of transition asset or liability)
  - b. Analysis of plan status, costs, and cash flows
  - c. Impact of pension reporting on corporate earnings
- 3. Employee stock compensation plans
  - a. Disclosures
  - b. Analysis of costs and liability
- K. Analysis of Inter-Corporate Investments
  - 1. Accounting for marketable securities
    - a. Cost method
    - b. Market method
    - c. Lower of cost or market method
    - d. U.S. and international accounting requirements
  - 2. Analysis of marketable securities
    - a. Separation of operating from investment results
    - b. Effects of classification of marketable securities
    - c. Analysis of investment performance
  - 3. Equity method of accounting
    - a. Conditions for use
    - b. Equity accounting and analysis
  - 4. Consolidations policy and procedures
    - a. Comparison of consolidation with the equity method
    - b. Analysis of minority interest
    - c. Non-U.S. consolidation practices
    - d. Analysis of segment data
- L. Analysis of Business Combinations
  - 1. Accounting for acquisitions
  - 2. Effects of accounting methods
  - 3. International differences in accounting for business combinations
  - 4. Analysis of goodwill
  - 5. Choosing the acquisition method
  - 6. Spin-offs and tracking stocks
- M. Analysis of Multinational Operations
  - 1. Effects of exchange rate changes on a firm's actual and reported performance
    - a. Flow effect
    - b. Holding gain/loss effect
  - 2. Basic accounting issues
    - a. Choice of exchange rates (e.g., historical rate or current rate)

- b. Assets or liabilities to be adjusted for exchange rate changes
    - c. Treatment of translation gains and losses
  - 3. Prescribed foreign currency translation
  - 4. Choice of the functional currency for a foreign subsidiary
  - 5. Comparison of translation and remeasurement
    - a. Income statement effects
    - b. Balance sheet effects
    - c. Impact on financial ratios
    - d. Impact on reported cash flows
  - 6. Analysis of foreign currency disclosures
    - a. Exchange rate changes: exposure and effects
- N. Ratio and Financial Analysis
  - 1. Common-size statements
  - 2. Activity analysis and turnover ratios
    - a. Short-term and long-term activity ratios
    - b. Turnover ratios (inventory, receivables, payables, working capital, fixed asset and total asset)
  - 3. Liquidity analysis
    - a. Length of cash cycle
    - b. Working capital ratios
  - 4. Long-term debt analysis
    - a. Debt covenants
    - b. Debt ratios
    - c. Interest coverage ratios
  - 5. Profitability analysis
    - a. Return on sales (gross margin, operating margin, pretax margin, profit margin)
    - b. Return on investment (e.g., return on assets, return on total capital, return on equity)
  - 6. Operating and financial leverage
  - 7. Earnings per share (EPS)
    - a. Basic EPS
    - b. Diluted EPS
    - c. Weighted-average number of common shares outstanding
    - d. Convertible securities
    - e. Options and warrants
    - f. Contingent shares
  - 8. Other ratios and value metrics
    - a. Earnings before interest, taxes, depreciation and amortization (EBITDA)
    - b. Price-to-earnings (P/E)
    - c. Price-to-book value (P/B)
  - 9. Integrated ratio analysis
  - 10. Valuation implications of financial statement analysis
    - a. Inter-corporate investments
    - b. Business combinations
    - c. Multinational operations
    - d. Ratio and financial analysis

## **V. CORPORATE FINANCE**

### **A. Fundamental Issues**

1. Forms of business organization
  - a. Sole proprietorship
  - b. Partnership
  - c. Corporation
2. Corporate governance issues
  - a. Agency relationships (i.e., stockholders, management, other stakeholders)
  - b. Managerial incentives to act in stockholders' interests

### **B. Capital Investment Decisions**

1. Investment decision criteria
  - a. Net present value (NPV) approach
  - b. Payback period rule
  - c. Discounted payback rule
  - d. Average accounting return
  - e. Internal rate of return (IRR) approach
  - f. Profitability index
2. Cash flow projections
  - a. Incremental
  - b. Common pitfalls (e.g., sunk costs, opportunity costs, side effects, net working capital, financing costs)
  - c. Project cash flows and alternative definitions of operating cash flows
  - d. Uses of discounted cash flow analysis
3. Project analysis and evaluation
  - a. Scenario analysis
  - b. Sensitivity analysis
  - c. Simulation analysis
4. Capital rationing

### **C. Business and Financial Risk**

1. Breakeven analysis
  - a. Fixed versus variable costs
  - b. Accounting break-even
2. Operating leverage
  - a. Implications (e.g., forecasting risk)
  - b. Measurement (i.e., degree of operating leverage)
3. Financial leverage
  - a. Implications (e.g., forecasting risk)
  - b. Measurement (e.g., degree of financial leverage)
4. Total combined leverage

### **D. Long Term Financial Policy**

1. Cost of capital
  - a. Required return and cost of capital
  - b. Cost of equity (e.g., dividend growth model approach and security market line approach)
  - c. Cost of debt and preferred stock

- d. Weighted average cost of capital
- e. Marginal cost of capital
- f. Divisional and project costs of capital
- g. Flotation costs and weighted average cost of capital
- 2. The effects of financial leverage
  - a. Capital structure and the cost of equity capital
  - b. Miller and Modigliani propositions
    - (1) Value of firm independent of capital structure (no taxes)
    - (2) Cost of equity is positive linear function of capital structure (differential taxes)
  - c. Bankruptcy risk
  - d. Optimal capital structure
- 3. Dividends and dividend policy
  - a. Forms of dividends (e.g., regular, extra, special, liquidating)
  - b. Dividend payment chronology
  - c. Factors affecting dividend payout policy (e.g., taxes, flotation costs, dividend restrictions, investor preference for current income, information content of dividends, clientele effect)
  - d. Dividend policies (e.g., residual approach, stability, target payout, stock repurchase, stock dividends, splits, reverse splits, forecasting dividends)
- E. Mergers and Acquisitions
  - 1. Legal forms of acquisition
    - a. Merger or consolidation
    - b. Acquisition of stock
    - c. Acquisition of assets
  - 2. Classifications
    - a. Horizontal
    - b. Vertical
    - c. Conglomerate
  - 3. Gains from acquisition
    - a. Perceived synergy
    - b. Brand building
    - c. Revenue enhancement
    - d. Cost reductions
    - e. Lower taxes
    - f. Capital requirements
  - 4. Defensive tactics
    - a. Supermajority clause in corporate charter
    - b. Repurchase/standstill agreements (e.g., greenmail)
    - c. Exclusionary self-tenders
    - d. Poison pills and share rights plans
    - e. Going private and leveraged buyouts

F. Valuation Implications of Corporate Finance

1. Capital investment decisions
2. Long term financial policy
3. Mergers and acquisitions

**VI. ANALYSIS OF EQUITY INVESTMENTS**

A. Organization and Functioning of Securities Markets

1. Primary capital markets
2. Secondary financial markets
  - a. Exchange markets
  - b. Over-the-counter (OTC) market
  - c. Electronic markets/exchanges
3. Types of orders

B. Security Market Indexes and Benchmarks

1. Broad market versus specialized indexes
2. Stock market indicator series
  - a. Price-weighted series
  - b. Value-weighted series
  - c. Unweighted price indicator series
  - d. Global equity indexes

C. Equity Risk Definition (e.g., statistical, economic, downside, relative, absolute, political) and Measurement

1. Single factor models (e.g., capital asset pricing model (CAPM))
  - a. Measurement of the risk premium
  - b. Variants on the risk-free rate of return
  - c. Estimating the CAPM parameters
2. Multi-factor models
  - a. Fundamental multi-factor model
  - b. Arbitrage pricing theory (APT)
    - (1) Nature and estimation of risk parameters
    - (2) Applying the APT
  - c. Practical limitations of risk measurement for the equity analyst
  - d. International equity investing (e.g., emerging market equities)

D. Fundamental Analysis

1. Theory of valuation
  - a. Stream of expected returns
    - (1) Cash flows
    - (2) Dividends
    - (3) Earnings
  - b. Discount rate determination
    - (1) Required rate of return
    - (2) Real risk-free rate of return
    - (3) Expected rate of inflation
    - (4) Risk premium
  - c. Investment decision process
    - (1) Comparing estimated values and market prices to uncover misvaluation
  - d. Role of market efficiency

- (1) Assumptions for informationally efficient market
- (2) Alternative Efficient Market Hypotheses: weak form, semi-strong form, strong form
- (3) Violations of assumptions in real capital markets
- (4) Implications of capital market efficiency for financial analysis and valuation
2. Analysis of world security markets
  - a. Inflation and exchange rates
  - b. Correlations among stock index returns
  - c. Global sector indexes
  - d. Individual country macro-economic analysis
  - e. Individual country cross-sector analysis
3. Valuation of stock market series (e.g., S&P 500, FT100)
  - a. Variables for estimation of future earnings per share (e.g., nominal GDP, operating profit margin, depreciation, interest, tax rate)
  - b. Variables for estimation of future earnings multiplier (e.g., required rate of return, dividend growth rate, dividend payout, real risk free rate, risk premium for common stock, earnings retention rate, equity return)
  - c. Methodology for estimating market series earnings multiplier
    - (1) Direction of change approach
    - (2) Specific estimate approach
    - (3) Historical trends in multiples
  - d. Expected rate of return on common stocks
4. Industry analysis
  - a. Business cycle analysis
  - b. Effect of structural economic conditions on various industries (e.g., demographics, technology, politics, regulatory environment)
  - c. Analysis of competitive environment (e.g., Porter framework: competitor rivalry, new entrants, substitute products, bargaining power of buyers and suppliers)
    - (1) Industry rates of return
    - (2) Relative company returns
  - d. Global industry analysis
5. Company analysis
  - a. Company characteristics
  - b. Growth analysis and measurement
    - (1) Approaches to estimating growth rates
    - (2) Distinguishing sustainable and non-sustainable growth
    - (3) Growth duration analysis
    - (4) Franchise value and the growth process
  - c. Disaggregation of return on assets (ROA) and return on equity (ROE) (i.e., DuPont analysis)
  - d. Competitive strategy analysis for companies (e.g., low cost, product differentiation)
  - e. Approaches to equity valuation
    - (1) Dividend discount models (e.g., one period model, single stage (Gordon growth) model, two-stage model, H-model, three-stage model)
    - (2) Measures of relative value

- (a) Earnings multiplier (P/E)
- (b) Price-to-book value ratio (P/B)
- (c) Graham and Dodd liquidation model
- (d) Price-to-sales ratio (P/S)
- (3) Free cash flow-to-equity and free cash flow-to-the firm approaches
- (4) Measures of value added
  - (a) Economic value added (EVA<sup>®</sup>)
  - (b) Market value added (MVA<sup>™</sup>)
  - (c) Cash flow return on investment (CFROI)
- (5) Effect of inflation on the valuation process
- E. Special Applications of Fundamental Analysis
  - 1. Analysis of corporate restructuring events
    - a. Rationales for mergers, leveraged buyouts (LBOs), divestitures, strategic alliances, tracking stocks, joint ventures, spin-offs, and holding company formation
    - b. Valuation of corporate restructuring events
  - 2. Valuation of preferred stock and convertible securities
- F. Technical Analysis
  - 1. Definition and assumptions
    - a. Supply and demand
    - b. Persistent price trends
    - c. Turning points
  - 2. Indicators, rules, and theories
    - a. Indicators (e.g., expectational, flow of funds, market structure)
    - b. Rules (e.g., contrary opinion)
    - c. Theories (e.g., Dow, Elliot Wave)

## **VII. ANALYSIS OF DEBT INVESTMENTS**

- A. Debt Securities
  - 1. Features of debt securities
    - a. Indenture and covenants
    - b. Maturity
    - c. Par value
    - d. Coupon rate
      - (1) Zero-coupon bonds
      - (2) Step-up notes
      - (3) Deferred coupon bonds
      - (4) Floating-rate securities
      - (5) Accrued interest
    - e. Conversion privilege
    - f. Put provision
    - g. Currency denomination
    - h. Embedded options
    - i. Borrowing funds to purchase bonds
      - (1) Margin buying
      - (2) Repurchase agreement (repos)
  - 2. Provisions for paying off bonds

- a. Call and refunding provision
  - (1) Call schedule
  - (2) Noncallable versus nonrefundable bonds
  - (3) Regular versus special redemption prices
- b. Prepayments
- c. Sinking fund provisions
- d. Index amortizing notes
- 3. Debt market structure
  - a. Types of markets (e.g., direct search or private placement markets, brokered markets, dealer markets, auction markets)
  - b. Electronic trading systems
- B. Risks Associated with Investing in Bonds
  - 1. Interest rate risk
    - a. Price/yield relationship
    - b. Impact of bond features on interest rate risk (e.g., maturity, coupon rate, embedded options)
    - c. The impact of the yield level
    - d. Interest rate risk for floating-rate securities
    - e. Measuring interest rate risk (e.g., approximating percentage price change, approximating dollar price change)
  - 2. Yield curve risk
  - 3. Call and prepayment risk
  - 4. Reinvestment risk
  - 5. Credit risk
    - a. Default risk
    - b. Credit spread risk
    - c. Downgrade risk
  - 6. Liquidity risk
    - a. Liquidity risk and marking positions to market
    - b. Changes in liquidity risk
  - 7. Exchange rate or currency risk
  - 8. Inflation or purchasing power risk
  - 9. Volatility risk
  - 10. Event risk
    - a. Natural catastrophes
    - b. Corporate takeover / restructurings
    - c. Regulatory risk
    - d. Political risk
- C. Global Bond Sectors and Instruments
  - 1. U.S. Treasuries and other government securities
    - a. Types of Treasury securities (e.g., bills, notes, bonds, inflation protection securities)
    - b. The Treasury auction process
    - c. The secondary market (e.g., on-the-run issues, off-the-run issues, role of government securities dealers)
    - d. Pricing conventions

- e. Treasury strips
  - (1) Coupon strips
  - (2) Principal strips
- f. Federal agency securities
  - (1) Agency debentures
  - (2) Agency mortgage-backed securities
    - (a) Mortgage passthrough securities
    - (b) Collateralized mortgage obligations
- 2. Municipal securities (including European)
  - a. Tax-backed debt (e.g., general obligation debt, appropriation-backed obligation)
  - b. Revenue bonds
  - c. Special bond structures (e.g., insured bonds, prerefunded bonds)
- 3. Corporate debt instruments
  - a. Bankruptcy and bondholder rights
  - b. Factors considered in assigning a credit rating
  - c. Corporate bonds
  - d. Medium-term notes
  - e. Commercial paper
  - f. Bankers' acceptances
  - g. Certificates of deposit
- 4. Asset-backed and mortgage-backed securities
  - a. The role of the special purpose vehicle
  - b. Credit enhancement mechanisms
- 5. International bonds
  - a. Global bonds
  - b. Sovereign debt
  - c. Emerging market bonds
- D. Yield Spreads
  - 1. The role of the central bank in influencing interest rates
    - a. Policy tools
    - b. Interest rates over the business cycle
    - c. Inflation and interest rates
  - 2. The Treasury yield curve
  - 3. Measuring yield spreads (e.g., absolute yield spread, relative yield spread)
    - a. Intermarket sector spreads and intramarket spreads
    - b. Credit spreads
    - c. Effect of embedded options
  - 4. Effect of issue size/liquidity on spreads
- E. Introduction to the Valuation of Debt Securities
  - 1. General principles of valuation
    - a. Estimating cash flows
    - b. Determining the appropriate rate or rates
    - c. Discounting the expected cash flows
    - d. Valuation using multiple discount rates
    - e. Valuing semiannual cash flows
    - f. Valuing a zero-coupon bond

- g. Valuing a bond between coupon payments
    - (1) Computing the full price
    - (2) Computing the accrued interest and the clean price
    - (3) Day count conventions
  - 2. The arbitrage-free valuation approach (e.g., using treasury spot rates, credit spreads)
- F. Yield Measures, Spot Rates, and Forward Rates
  - 1. Sources of return
    - a. Coupon interest payments
    - b. Capital gain or loss
    - c. Reinvestment income
  - 2. Traditional yield measures
    - a. Current yield
    - b. Yield to maturity (including bond equivalent yield convention)
    - c. Yield to call
    - d. Yield to put
    - e. Yield to worst
    - f. Cash flow yield
    - g. Yield spread measures for floating-rate securities
    - h. Yield on Treasury bills
  - 3. Theoretical spot rates
    - a. Bootstrapping approach for constructing the theoretical spot rate curve for treasuries
    - b. Yield spread measures relative to a spot rate curve
  - 4. Forward rates
    - a. Deriving 6-month (i.e., 1-period) forward rates
    - b. Relationship between spot rates and short-term forward rates
    - c. Valuation using forward rates
    - d. Computing any forward rate
- G. Measurement of Interest Rate Risk
  - 1. The full valuation approach
    - a. Scenario analysis
    - b. Stress testing
    - c. Total return assumptions
    - d. Interpreting the results
  - 2. Price volatility characteristics of bonds
    - a. Price volatility characteristics of option-free bonds (including price/yield convexity)
    - b. Price volatility characteristics of bond with embedded options (e.g., call/prepay, put)
  - 3. Duration
    - a. Defining duration
    - b. Calculating duration
    - c. Approximating the percentage price change using duration
    - d. Size of rate changes and duration estimate
    - e. Modified duration versus effective duration
    - f. Macaulay duration and modified duration

- g. Interpretations of duration (e.g., as first derivative, as some measure of time)
- h. Duration of a floating-rate note (including inverse floaters)
- i. Portfolio duration (including leverage, derivatives)
- j. Spread duration for fixed-rate bonds
- 4. Convexity
  - a. Convexity measure
  - b. Convexity adjustment to percentage price change
  - c. Modified convexity
  - d. Effective convexity
- 5. Price value of a basis point (or DV01) (including its relationship to duration)
- H. The Term Structure and Volatility of Interest Rates
  - 1. Yield curve shifts (e.g., parallel shift, nonparallel shift, twist, butterfly)
  - 2. Treasury returns resulting from yield curve movements
  - 3. Constructing the theoretical spot rate curve for Treasuries
    - a. On-the-run Treasury issues (par yield curve)
    - b. On-the-run Treasury issues and selected off-the-run treasury issues
    - c. All treasury coupon securities and bills
    - d. Treasury coupon strips
  - 4. Theories of the term structure
    - a. The Pure Expectations Theory
    - b. Biased Expectations Theories
    - c. Market Segmentation Theory
    - d. Preferred Habitat Theory
  - 5. Measuring yield curve risk (e.g., rate duration, key rate duration)
  - 6. Yield volatility and measurement
    - a. Historical versus implied volatility
    - b. Forecasting yield volatility
- I. Valuing Bonds with Embedded Options
  - 1. The Binomial Model
  - 2. Valuing and analyzing a callable bond
    - a. Determining the call option value
    - b. Effect of volatility on the arbitrage-free value
    - c. Option-adjusted spread (OAS)
    - d. Effective duration and effective convexity
    - e. Price/yield relationship of a callable vs. option-free bond
  - 3. Valuing a puttable bond
    - a. Determining the put option value
    - b. Effect of volatility on the value
    - c. Price/yield relationship of a puttable vs. option-free bond
  - 4. Analysis of convertible bonds
    - a. Investment characteristics of a convertible security
    - b. An option-based valuation approach for convertible securities
    - c. The risk/return profile of a convertible security
- J. Mortgage-Backed Securities (MBS)
  - 1. Features
    - a. Mortgage passthrough securities

- (1) Cash flow characteristics
      - (2) Prepayment conventions and cash flow
    - b. Collateralized Mortgage Obligations (CMOs) including those with planned amortization class (PAC) tranches
  - 2. Stripped mortgage-backed securities
    - a. Principal-only (PO) strips including price change, duration, convexity characteristics
    - b. Interest-only (IO) strips including price change, duration, convexity characteristics
  - 3. Nonagency mortgage-backed securities
  - 4. Commercial mortgage-backed securities
  - 5. International mortgage-backed securities
- K. Asset-Backed Securities
- 1. Features of an asset-backed security
    - a. Amortizing versus nonamortizing assets
    - b. Fixed-rate versus floating-rate
    - c. Credit enhancements
    - d. Passthrough versus pay through structures
    - e. Optional clean-up call provisions
  - 2. Types of securities
    - a. Auto loan-backed securities
    - b. Credit card receivable-backed securities
- L. Valuing Mortgage-Backed and Asset-Backed Securities
- 1. Cash flow yield analysis (static cash flow yield)
    - a. Limitations of cash flow yield measure
    - b. Nominal spread
  - 2. Zero-volatility spread (the Z-spread)
  - 3. Monte Carlo simulation model and option-adjusted spread (OAS)
  - 4. Measuring interest rate risk of MBS (including duration measures such as effective duration, cash flow duration, coupon curve duration, empirical duration)
  - 5. Valuing asset-backed securities
- M. Assessing Trading Strategies
- 1. The principle of leverage
  - 2. Borrowing funds via repurchase agreements (repo)
    - a. Margin and marking to market
    - b. Delivery and credit risk
    - c. Repo mechanics
    - d. Determinants of the Repo rate
  - 3. Total return analysis
    - a. Computing the expected total return
    - b. Yield curve trades
  - 4. Controlling for interest rate risk in assessing trading strategies
- N. Principles of Credit Analysis
- 1. Analysis of an issuer's character
  - 2. Analysis of the capacity to pay
    - a. Industry analysis

- b. Traditional ratios
  - c. Cash flow analysis
- 3. Analysis of collateral
- 4. Analysis of covenants
- 5. Analysis of management quality
- 6. Special considerations for high-yield corporate bonds
  - a. Analysis of debt structure
  - b. Analysis of corporate structure
  - c. Analysis of covenants
  - d. Equity analysis approach
  - e. Default rates on high yield securities
- 7. Credit analysis of non-corporate bonds
  - a. Asset-backed securities
  - b. Municipal bonds
  - c. Sovereign bonds

### **VIII. ANALYSIS OF DERIVATIVES**

#### **A. Derivative Markets and Instruments**

- 1. Purposes of derivative markets
  - a. Price discovery
  - b. Speculation
  - c. Hedging
- 2. Elementary pricing principles
  - a. Arbitrage and risk neutral pricing
  - b. Fair value
  - c. Storage and carrying costs
- 3. Sources of risk (e.g., interest rates, equity prices, commodity prices, exchange rates, credit, model, operational, legal, accounting, tax, regulatory, settlement, liquidity, systemic, other)

#### **B. Forward Markets and Instruments**

- 1. Structure of global forward markets
- 2. Basic definitions of forward contracts
- 3. Credit risk in forward contracting
- 4. Types and characteristics of forward contracts
  - a. Equity
  - b. Interest rate (forward rate agreements (FRA))
  - c. Commodity
  - d. Currency
  - e. Other (e.g., power, weather)
- 5. Valuing forward contracts
  - a. Contract value at expiration
  - b. Contract value at initiation
  - c. Contract value during its life
  - d. Pricing a generic forward contract
  - e. Pricing an FRA
  - f. Pricing a foreign currency forward: interest rate parity
- 6. Forward contract strategies

- a. Hedging long exposure
  - b. Hedging short exposure
  - c. Speculating
- C. Futures Markets
1. Structure of global futures markets (e.g., exchanges, trading, margin, clearinghouse, settlement, electronic markets)
  2. Contract types and characteristics
    - a. Interest rate futures
    - b. Equity futures
    - c. Foreign exchange futures
    - d. Commodity futures
  3. Valuing futures contracts
    - a. Price convergence at expiration
    - b. Value of a contract today
    - c. Value of a contract during its life
    - d. The cost of carry pricing model
      - (1) The general case
      - (2) Interest rate futures
      - (3) Equity futures
      - (4) Foreign exchange futures
    - e. Backwardation/contango
    - f. Convenience yield
    - g. The basis and spreads
    - h. Futures prices and expectations
    - i. Futures prices and forward prices
  4. Applications of futures
    - a. Hedging long positions
    - b. Hedging short positions
    - c. Cross-hedging
    - d. Calculating the optimal hedge ratio
    - e. Arbitrage and synthetic instruments using futures
    - f. Equitizing cash
    - g. Asset allocation
    - h. Portfolio insurance and dynamic hedging
- D. Options Markets
1. Structure of global options markets (e.g., exchange-listed, over-the-counter, electronic)
  2. Basic definitions and characteristics of options contracts
    - a. Call vs. put
    - b. Exercise price
    - c. Expiration
    - d. Exercise style (American vs. European)
    - e. Moneyness
    - f. Standardization vs. customization
  3. Underlying instruments
    - a. Bonds

- (1) Caps
  - (2) Floors
  - (3) Collars
- b. Stocks
- c. Commodities
- d. Futures
- e. Currencies
  - (1) Individual currency options
  - (2) Currency baskets
- f. Other (i.e., synthetics, power, weather)
- 4. Option Trading
  - a. Exchange-traded market making
  - b. Brokerage
  - c. Over-the-counter dealers
  - d. Settlement and exercise
- 5. Valuing options
  - a. Minimum values
  - b. Maximum values
  - c. Expiration/exercise values
  - d. Lower bounds (adjusted exercise value)
  - e. Time value effect
  - f. Effect of exercise price
  - g. Early exercise of American options
  - h. Effect of interest rates
  - i. Effect of volatility
  - j. Put-call parity
  - k. Put-call-forward parity
  - l. Effect of dividends on option prices
- 6. Option pricing (valuation) models
  - a. Binomial model
    - (1) One-period binomial model
      - (a) Construction of a risk-free portfolio
      - (b) Binomial pricing formula
      - (c) Executing an arbitrage
    - (2) Multiperiod binomial model
      - (a) Dynamic construction of a risk-free portfolio
      - (b) Multiperiod pricing formula
      - (c) Executing an arbitrage
      - (d) Limiting cases
  - b. Black-Scholes model
    - (1) Lognormal distribution as the underlying structure
    - (2) Constructing and dynamically adjusting a risk-free portfolio
    - (3) Solving the Black-Scholes formula
    - (4) Sensitivity of the formula to inputs
      - (a) Stock price: delta and gamma
      - (b) Exercise price

- (c) Risk-free rate: rho
- (d) Time to expiration: theta
- (e) Volatility: vega
- (f) Dividends: dividend rho
- (5) Incorporating dividends into the formula
- 7. Managing an option portfolio
  - a. Delta hedging
  - b. Gamma hedging
  - c. Vega hedging
  - d. Dynamic portfolio insurance
- 8. Option trading strategies
  - a. Basic long and short call transactions
  - b. Basic long and short put transactions
  - c. Covered calls
  - d. Protective puts
  - e. Synthetic puts and calls
  - f. Spreads
    - (1) Butterfly
    - (2) Bull
    - (3) Bear
  - g. Interest rate risk management strategies
    - (1) Caps
    - (2) Floors
    - (3) Collars
  - h. Put-call combinations
    - (1) Straddles
    - (2) Straps and strips
- E. Swaps Markets
  - 1. Structure of global swaps markets
  - 2. Basic definitions of swaps
  - 3. Types and characteristics of swaps
    - a. Currency
    - b. Interest rate
    - c. Equity
    - d. Commodity
    - e. Other (e.g., power, weather)
  - 4. Valuing swaps
    - a. Payments at settlement dates and payment conventions
    - b. Valuation
      - (1) At initiation
      - (2) During its life
      - (3) As a series of forward contracts
      - (4) As a combination of bonds
      - (5) Valuing interest rate swaps
      - (6) Valuing currency swaps
      - (7) Valuing equity swaps

5. Swap strategies
  - a. Currency swaps
    - (1) Converting a loan in one currency to a loan in another
    - (2) Synthesizing a dual currency bond
    - (3) Converting foreign cash receipts into domestic cash receipts
  - b. Interest rate swaps
    - (1) Converting a fixed-rate loan to a floating-rate loan and vice versa
    - (2) Adjusting the duration of a fixed-income portfolio
    - (3) Synthesizing structured notes
  - c. Equity swaps
    - (1) Executing asset class changes
    - (2) Diversifying a concentrated portfolio
    - (3) Achieving international diversification
    - (4) Reducing an insider's exposure to the company's stock
  - d. Commodity swaps
    - (1) Hedging future revenues or costs
    - (2) Reducing the credit risk on a loan
6. Managing swap credit risk
  - a. Identifying types of credit risk
  - b. Measuring swap credit risk
  - c. Credit enhancements
    - (1) Netting
    - (2) Limiting exposure
    - (3) Collateral
    - (4) Marking to market
7. Forward swaps and swaptions
  - a. Basic definitions
  - b. Payoffs
  - c. Valuation and replication
  - d. Applications
    - (1) In anticipation of a future swap
    - (2) Termination a swap
    - (3) Speculating
    - (4) Converting callable to non-callable debt
    - (5) Converting putable to non-putable debt

## **IX. ANALYSIS OF ALTERNATIVE INVESTMENTS**

### **A. Real Estate**

1. Forms of commercial/multi-family real estate investment
  - a. Free and clear equity (fee simple)
  - b. Leveraged equity
  - c. Mortgages
  - d. Aggregation vehicles (e.g., limited partnership, open and closed end commingled funds, separate accounts and real estate investment trusts (REITs))
2. Valuation approaches
  - a. Real estate appraisal concepts
    - (1) Market value

- (2) Investment value
  - b. Cost approach
  - c. Sales comparison approach
  - d. Income approach
  - e. Discounted cash flow approach
- B. Investment Companies
  - 1. Valuing investment company shares
  - 2. Closed-end versus open-end investment companies (including exchange-traded funds)
  - 3. Fund management fees
  - 4. Investment strategies
    - a. Style
    - b. Sector
    - c. Index
    - d. Global
    - e. Stable value
- C. Venture Capital
  - 1. Stages of venture capital investing
  - 2. Risk
  - 3. Investment characteristics
  - 4. Types of liquidation
  - 5. Performance measurement
- D. Hedge Funds (e.g., characteristics, fee structure, leverage, short versus long)
- E. Closely-held Companies and Inactively Traded Securities
  - 1. Legal environment
  - 2. Valuation alternatives
  - 3. Bases for discounts/premiums (e.g., freely marketable minority value, enterprise value, third party sale value, book value)
- F. Distressed Securities/Bankruptcies
- G. Commodity Markets and Commodity Derivatives
  - 1. Types of commodity derivatives
    - a. Agricultural futures
    - b. Energy futures
    - c. Metals
  - 2. Fundamental concepts
  - 3. Analysis issues (e.g., contract specifications and delivery, cash and futures price quotations)
  - 4. Spreads

## **X. PORTFOLIO MANAGEMENT**

### **A. Capital Market Theory**

1. Markowitz Portfolio Theory
  - a. Assumptions
  - b. Inputs
  - c. Implications
  - d. Efficient Frontier
2. Asset pricing models
  - a. Single factor
  - b. Multi-factor
3. Efficient Market Hypothesis

### **B. Management of Individual Investor Portfolios**

1. Investor characteristics
  - a. Life cycle and age influences
  - b. Behavioral finance issues
2. Objectives
  - a. Establishing return requirements
  - b. Risk tolerance (e.g., ability, willingness)
3. Constraints
  - a. Liquidity
  - b. Time horizon
  - c. Tax exposure
  - d. Legal and regulatory
  - e. Unique circumstances
4. Investment policy statement
5. Investment strategy and asset allocation
  - a. Portfolio construction
  - b. Influence of taxes on investment strategy
  - c. Tax managed asset strategies
6. Investment vehicles and asset class exposures
  - a. Equities
  - b. Debt
  - c. Alternative assets
  - d. Tax-deferred or tax-exempt savings vehicles
  - e. Influence of risk and taxes in retirement products
  - f. Comparison of retirement savings vehicles
7. Wealth transfer, estate planning, and personal trusts

### **C. Management of Institutional Investor Portfolios**

1. Objectives
  - a. Return targets
  - b. Risk tolerance
2. Constraints
  - a. Liquidity
  - b. Time horizon
  - c. Tax exposure
  - d. Legal and regulatory

- e. Unique circumstances
- 3. Investment policy statement
- 4. Selection of investment managers/advisors
- 5. Fiduciary responsibility
- D. Pension Plan and Employee Benefit Funds
  - 1. Defined benefit plans
    - a. Legal principles
    - b. Corporate finance implications
  - 2. Defined contribution plans
    - a. Investment policy development
    - b. Participant education
    - c. Legal responsibilities
    - d. Investment strategies
  - 3. Other employee benefit plans
    - a. Money purchase
    - b. Cash balance plans
    - c. Cafeteria plans
    - d. Employee stock ownership plans
  - 4. Investment policy statement
- E. Endowment Funds and Foundations
  - 1. Spending policy
  - 2. Investment policy statement
- F. Insurance Companies
  - 1. Asset/liability management
  - 2. Investment policy statement
- G. Other Corporate Investors (investment policy considerations)
  - 1. Banks (e.g., spread management)
  - 2. Non-financial corporations (e.g., cash management)
- H. Capital Market Expectations
  - 1. Key macroeconomic factors affecting asset returns
    - a. Sources of data and analysis
    - b. Real (non-financial) economy role in security returns
    - c. Economic variables relevant to security prices
    - d. Impact of monetary policy
    - e. Impact of fiscal policy
  - 2. Macro valuation model
  - 3. Developing macroeconomic expectations
    - a. Industrialized economies
    - b. Emerging markets
  - 4. Macroeconomic forecasts in determining asset class/security return expectations
    - a. Using economic forecasts for asset allocation
    - b. Using market forecasts for sector rotation
  - 5. Relationship of economic activity to the investment process
- I. Asset Allocation
  - 1. Determination of asset mix
    - a. Strategic

- b. Tactical
- 2. Assessment of opportunities
  - a. Framework for allocating assets globally
  - b. Global asset allocation strategy
- 3. Selection of asset classes
- 4. Issues in multiple manager environment
- J. Portfolio Construction and Revision
  - 1. Inputs to portfolio construction and revision
  - 2. Diversification issues
    - a. Diversification types (e.g., asset, time)
    - b. Sector and industry selection
    - c. International
  - 3. Implementation issues
    - a. Global custody
    - b. Transactions costs (e.g., measurement, impact, foreign exchange translation)
    - c. Constraints
  - 4. Portfolio monitoring and rebalancing
    - a. Approaches to portfolio rebalancing
    - b. Issues in portfolio rebalancing (e.g., frequency, extensiveness)
- K. Equity Portfolio Management Strategies
  - 1. Active management
    - a. Benchmark selection
    - b. Style
      - (1) Types (e.g., value, growth, size)
      - (2) Style weights
      - (3) Style drift
      - (4) Limitations
  - 2. Passive management (e.g., indexing)
  - 3. Semi-active strategies
    - a. Enhanced indexing
    - b. Core plus active
  - 4. Cross-border strategies
    - a. Sector/industry
    - b. Country
  - 5. Derivatives-enabled strategies
- L. Debt Portfolio Management Strategies
  - 1. Active management
    - a. Benchmark selection
    - b. Yield curve positioning
    - c. Duration-altering strategies based on level, slope and curvature of yield curves
    - d. Riding the yield curve
    - e. Corporate bond strategies (including investment grade and high yield)
    - f. Mortgage-backed strategies
    - g. Asset-backed strategies
    - h. Trading strategies and constraints
  - 2. Passive management

3. Semi-active strategies (e.g., enhanced indexing)
  4. Immunization strategies
    - a. Liability funding strategies
    - b. Contingent immunization
    - c. Single-liability immunization
    - d. Multiple-liability immunization
    - e. Cash flow matching (e.g., dedication)
  5. Derivatives-enabled strategies
    - a. Controlling yield curve risks
    - b. Controlling interest rate risks
    - c. Controlling credit risk
    - d. Currency hedged portfolios
  6. Cross border issues
    - a. Currency risk management
    - b. Country risk analysis
- M. Real Estate and Alternative Investments in Portfolio Management
1. Traditional diversification in real estate portfolios
    - a. Within real estate strategies
    - b. Use and comparison of direct investment portfolios (DIPs), stock investment portfolios (SIPs), and various forms of real estate investment trusts (e.g., EREITs, MREITs, hybrid REITs)
  2. Analysis of critical attributes
    - a. Systematic factors analysis
    - b. Transaction costs and clientele effects
    - c. Number and size of properties
  3. Factors influencing real estate returns
    - a. Leverage
    - b. Type of vehicle
  4. Real estate in a multiple asset class portfolio
    - a. Contribution to portfolio diversification
    - b. Inflation hedging attributes
    - c. Limitations of real estate data
- N. Risk Management
1. Firm wide risk management
    - a. Fundamental framework
      - (1) Investment vs. operational
      - (2) Model risk vs. input risk
    - b. Developing risk management policy and programs
      - (1) Fiduciary duties
      - (2) Plan sponsor role
      - (3) Behavioral factors
    - c. Sources of risk
      - (1) Sovereign and political risks
      - (2) Economic and financial risks
      - (3) Regulatory and fiscal risks
      - (4) Currency risk

- (5) Factor risks
  - (6) Option positions
  - (7) Credit risk
- d. Managing market, credit, and other risk
  - (1) Managing market risk
  - (2) Managing credit risk
  - (3) Managing other risks
- e. Value at risk (VAR) and other approaches to risk measurement and management
  - (1) Analytical/variance-covariance/delta-normal method
  - (2) Historical method
  - (3) Monte Carlo simulation
  - (4) Uses and limitations of VAR
  - (5) Stress testing
  - (6) Scenario analysis
  - (7) Extreme value theory and analysis
  - (8) Sources of information (e.g., RiskMetrics)
- f. Capital adequacy
- 2. Portfolio Risk Management
  - a. Mechanics of hedging
    - (1) Estimating the hedge ratio
    - (2) Results of the hedge
    - (3) Managing the hedge
    - (4) Tax considerations
    - (5) Hedging option positions
  - b. Managing interest rate risk with derivatives
    - (1) Managing to a target duration
    - (2) Hedging with interest rate futures
    - (3) Determining the number of futures contracts
    - (4) Monitoring and evaluating the hedge
  - c. Managing risk for embedded-risk securities (e.g., hedging mortgage-backed securities (MBS))
  - d. Managing currency risk
    - (1) Strategies
    - (2) Time horizon
    - (3) Market integration implications
- O. Performance Measurement
  - 1. Return measures (arithmetic, geometric, time weighted, dollar weighted) including derivatives-enhanced positions
  - 2. Risk-adjusted measures
    - a. Sharpe Ratio
    - b. Treynor Ratio
    - c. Jensen's Alpha
    - d. Information Ratio
    - e. Effect of expenses
    - f. Role in benchmark selection
    - g. Effect of random events

