



# Common Knowledge Base

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# Common Knowledge Base

## Part 1 Economics

Microeconomics

Macroeconomics

Macro Dynamics

International Economy and Foreign Exchange Market

Financial Markets

## Economics

### Broad Learning Objectives

To understand basic concepts and core principles of economics, including key components of economic activity, so as to be able to apply economic models/tools to address the many important issues that affect the investment decision-making process (e.g. forecasting business cycles and economic growth, company/industry/country analysis etc.).

### The Common Knowledge Base

#### 1. Microeconomics

##### 1.1 Consumer behaviour

- 1.1.1 Rational consumption behaviour
- 1.1.2 Labour supply
- 1.1.3 Inter-temporal consumption-saving decision
- 1.1.4 Choice under uncertainty

##### 1.2 Corporate behaviour

- 1.2.1 Production behaviour
- 1.2.2 Cost minimization
- 1.2.3 Profit maximization

##### 1.3 Market equilibrium

- 1.3.1 Perfectly competitive markets
- 1.3.2 Economic efficiency
- 1.3.3 Imperfectly competitive markets

##### 1.4 Information, market failure and regulation

- 1.4.1 Markets with asymmetric information
- 1.4.2 Externality and public goods
- 1.4.3 Market failure and regulation

## 2. Macroeconomics

- 2.1 Measuring national income and price
  - 2.1.1 National income accounting
  - 2.1.2 Price indices
  - 2.1.3 National income and price in local market
  
- 2.2 Equilibrium in the real market
  - 2.2.1 Consumption
  - 2.2.2 Investment
  - 2.2.3 Government expenditure
  - 2.2.4 Equilibrium relationship in the goods/service market: IS curve
  
- 2.3 Equilibrium in the money market
  - 2.3.1 Money and supply of money (including classification and money statistics)
  - 2.3.2 Credit creation and supply of inside money
  - 2.3.3 Demand for money
  - 2.3.4 Equilibrium relationship in the monetary market: LM curve
  
- 2.4 Equilibrium in economy and aggregate demand
  - 2.4.1 Equilibrium relationship between national income and interest rate in the economy: IS–LM curve
  - 2.4.2 Aggregate demand
  
- 2.5 Aggregate supply and determination of price of goods/services
  - 2.5.1 Labour market and employment
  - 2.5.2 Aggregate supply

## 3. Macro Dynamics

- 3.1 Inflation
  - 3.1.1 Definition and type of inflation
  - 3.1.2 Unemployment and inflation rate
  - 3.1.3 Illusion and inflation
  - 3.1.4 Inflation and unemployment rate in local market (including comparative analysis with major foreign countries)
  
- 3.2 Economic growth
  - 3.2.1 Main factor of economic growth
  - 3.2.2 Theory of economic growth
  - 3.2.3 Economic growth in local market (including comparative analysis with major foreign countries)

- 3.3 Business cycles
  - 3.3.1 Business cycles
  - 3.3.2 Theory of exogenous business cycle
  - 3.3.3 Theory of endogenous business cycle
  - 3.3.4 Fiscal/monetary policy and business cycle
  - 3.3.5 Business cycle in local market (including comparative analysis with major foreign countries)

## **4. International Economy and Foreign Exchange Market**

- 4.1 Open macroeconomics
  - 4.1.1 International balance of payments and capital flows
  - 4.1.2 International currency systems
  - 4.1.3 Determination of equilibrium national income in the open economy
- 4.2 Foreign exchange rate
  - 4.2.1 Determinants of exchange rate in the long run
  - 4.2.2 Determination of foreign exchange rates
  - 4.2.3 Government intervention and foreign exchange policy
  - 4.2.4 Structure of foreign exchange market (including comparative analysis with foreign countries)
  - 4.2.5 Foreign exchange risk and risk management
  - 4.2.6 Historical movement and forecasting of foreign exchange rate (including comparative analysis with major currency)

## **5. Financial Markets**

- 5.1 Functions of financial markets
  - 5.1.1 Direct and indirect finance
  - 5.1.2 Flow of fund accounts
- 5.2 Financial market institutions and arbitrage
  - 5.2.1 Financial markets (narrow definition: excluding negotiated markets)
  - 5.2.2 Market participants
  - 5.2.3 Arbitrage among markets and economic efficiency
- 5.3 Financial intermediaries
  - 5.3.1 Function of financial intermediaries
  - 5.3.2 Rational behaviour of lending
  - 5.3.3 Main banks
  - 5.3.4 International banking business and service
  - 5.3.5 Risk management of financial intermediaries
  - 5.3.6 Non-bank financial intermediaries

- 5.4 Financial regulations and deregulation (including major foreign markets in addition to local market)
  - 5.4.1 History of financial regulation
  - 5.4.2 Deregulation in the financial markets
  - 5.4.3 Creation of new markets
  - 5.4.4 Re-regulation
  
- 5.5 Central bank and monetary policy
  - 5.5.1 Organization and function of central bank
  - 5.5.2 Monetary policy
  - 5.5.3 Transmission effect of monetary policy on real economy
  - 5.5.4 Central bank operations in major countries
  - 5.5.5 Effect of monetary policy on security markets



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# **Common Knowledge Base**

## **Part 2**

# **Financial Accounting and Financial Statement Analysis**

Financial Accounting  
Financial Statement Analysis

## **II Financial Accounting and Financial Statement Analysis**

### **Broad Learning Objectives**

To intelligently assess factors important to investing decisions such as risk, liquidity and solvency, financial analysts should have: (i) a good understanding of accounting measurements which provide the raw data of the analysis; and (ii) a thorough knowledge of the methods and tools used in the analysis of financial statements.

### **The Common Knowledge Base**

#### **1. Financial Accounting**

##### **1.1 Financial reporting environment**

###### 1.1.1 Business activities and principal financial statements

###### 1.1.1.1 Overview of business activities

###### 1.1.1.2 Principal financial statements

###### 1.1.1.3 Relation between business activities and financial statements

###### 1.1.2 Financial reporting issues

###### 1.1.2.1 Uses of financial accounting reports

###### 1.1.2.2 Authority for establishing accounting standards

###### 1.1.2.3 Role of an audit of a firm's financial statements

##### **1.2 Framework for the preparation and presentation of financial statements**

###### 1.2.1 Objectives of financial statements

###### 1.2.2 Underlying assumptions of financial statements

###### 1.2.3 Qualitative characteristics of financial statements

###### 1.2.4 Elements of financial statements

###### 1.2.5 Recognition of elements of financial statements

###### 1.2.6 Measurement of elements of financial statements

###### 1.2.7 Concepts of capital and capital maintenance



### **1.3 Accounting procedures for preparing balance sheet and income statement**

- 1.3.1 Dual effects of transactions on the balance sheet equation
- 1.3.2 Purpose and use of accounts
- 1.3.3 Relation between balance sheet and income statement
- 1.3.4 Accounting process for a merchandising firm
  - 1.3.4.1 Journalizing
  - 1.3.4.2 Posting
  - 1.3.4.3 Trial balance preparation
  - 1.3.4.4 Adjustment and correction
  - 1.3.4.5 Financial statement preparation
- 1.3.5 Accounting process for a manufacturing firm

### **1.4 Statement of cash flows**

- 1.4.1 Rationale for the statement of cash flows
- 1.4.2 Relation between income flows and cash flows
- 1.4.3 Preparing the statements of cash flows

### **1.5 Generally accepted accounting principles: income recognition**

- 1.5.1 Accrual basis
  - 1.5.1.1 Criteria for revenue recognition
  - 1.5.1.2 Criteria for expense recognition
- 1.5.2 Income recognition for long-term contracts
  - 1.5.2.1 Completed contracts method
  - 1.5.2.2 Percentage of completion method
- 1.5.3 Income recognition when cash collectability is uncertain
  - 1.5.3.1 Instalment method
  - 1.5.3.2 Cost recovery method

## **1.6 Generally accepted accounting principles: assets, liabilities and shareholders' equities**

- 1.6.1 Assets: recognition, valuation and classification
  - 1.6.1.1 Liquid assets
  - 1.6.1.2 Inventories
  - 1.6.1.3 Property, plant, equipment and intangible assets
  - 1.6.1.4 Long-term investment in corporate securities
- 1.6.2 Liabilities
  - 1.6.2.1 Principles of liabilities recognition
  - 1.6.2.2 Hybrid securities
  - 1.6.2.3 Off-balance sheet financing agreements
  - 1.6.2.4 Commitment related to derivative financial instruments
  - 1.6.2.5 Leases
  - 1.6.2.6 Retirement benefits
  - 1.6.2.7 Income taxes
- 1.6.3 Shareholders' equities
  - 1.6.3.1 Issuance of capital stock
  - 1.6.3.2 Acquisition and reissue of treasury stock
  - 1.6.3.3 Cash, property and stock dividends
  - 1.6.3.4 Reserve accounting
  - 1.6.3.5 Other changes in retained earnings

## **1.7 Business combination**

- 1.7.1 Mergers and acquisitions
  - 1.7.1.1 Acquisitions
  - 1.7.1.2 Mergers
- 1.7.2 Consolidated financial statements
  - 1.7.2.1 Full line consolidation
  - 1.7.2.2 Partial consolidation

## **1.8 Foreign currency transactions**

- 1.8.1 Foreign currency transactions
  - 1.8.1.1 Initial recognition
  - 1.8.1.2 Reporting at subsequent B/S daily
  - 1.8.1.3 Recognition of exchange differences
- 1.8.2 Financial statements of foreign operations
  - 1.8.2.1 Classification of foreign operations
  - 1.8.2.2 Transaction of financial statements of foreign operations that are integral to the operations of the reporting enterprise
  - 1.8.2.3 Transaction of financial statements of foreign entities

## **2. Financial Statement Analysis**

### **2.1 Financial reporting and financial statement analysis**

- 2.1.1 Income flows vs cash flows
  - 2.1.1.1 Relation between net income and cash flows from operation
  - 2.1.1.2 net income and cash flows in various stages of life cycle
- 2.1.2 Quality of earnings/earnings management
  - 2.1.2.1 Data issues in analysing financial statements
  - 2.1.2.2 Significance and implications of alternative accounting principles on the financial statements
- 2.1.3 Earnings per share
  - 2.1.3.1 Calculation of EPS (simple capital structure and complex capital structure)
  - 2.1.3.2 Using EPS to value firms
  - 2.1.3.3 Criticisms of EPS
- 2.1.4 Segment reporting
  - 2.1.4.1 Definition
  - 2.1.4.2 Disclosure requirements
  - 2.1.4.3 Using segment information in the analysis
- 2.1.5 Interim financial statements

### **2.2 Analytical tools for gaining financial statement insights**

- 2.2.1 Balance sheets
  - 2.2.1.1 Common size analysis
  - 2.2.1.2 Time series analysis
- 2.2.2 Income statement
  - 2.2.2.1 Common size analysis
  - 2.2.2.2 Time series analysis

## **2.3 Analytical tools for assessing profitability and risk**

### 2.3.1 Profitability analysis

#### 2.3.1.1 ROA

#### 2.3.1.2 ROCE

### 2.3.2 Risk analysis

#### 2.3.2.1 Short-term liquidity risk

#### 2.3.2.2 Long-term solvency risk

#### 2.3.2.3 Financial distress risk

### 2.3.3 Break-even analysis

### 2.3.4 Pro forma financial statements

#### 2.3.4.1 Steps in preparing pro forma financial statements

#### 2.3.4.2 Conditions when common size percentages, growth rates and turnover provide the best projections of financial statement amounts

#### 2.3.4.3 Current issues in financial accounting and their effects on financial statement analysis

## **2.4 Financial statements and analysis of specific industries**

### 2.4.1 Banking

### 2.4.2 Insurance

### 2.4.3 Forestry



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# **Common Knowledge Base**

## **Part 3**

# **Asset Valuation and Portfolio Management**

Financial Markets and Instruments

Modern Portfolio Theory

Analysis and Valuation of Fixed Income Securities

Analysis and Valuation of Equity Investments

Analysis of Derivatives and Other Products

Investment Policy

Asset Allocation

Practical Portfolio Management

Performance Measurement

Management of Investment Institutions

## Asset Valuation and Portfolio Management

### Broad Learning Objectives

To provide a thorough knowledge of the theory underlying asset valuation and enable this theory to the major international investment markets and products most commonly used in those markets. To provide a thorough knowledge of the theory underlying portfolio management and enable application of this theory to global investment markets.

### The Common Knowledge Base

#### 1. Financial Markets and Instruments

- 1.1 Overview of financial markets
  - 1.1.1 Primary markets
  - 1.1.2 Secondary markets
  - 1.1.3 Market size
  - 1.1.4 Transaction costs
  - 1.1.5 Securities exchanges and over-the-counter markets
  - 1.1.6 Money markets and secondary markets
- 1.2 Functions of financial markets
  - 1.2.1 Capital formation
  - 1.2.2 Liquidity
- 1.3 Regulation of capital markets
  - 1.3.1 Motives
  - 1.3.2 Local regulations
- 1.4 Equity markets and structures
  - 1.4.1 Structure of major equity markets
  - 1.4.2 Types of equity securities
  - 1.4.3 Equity derivatives
  - 1.4.4 Indices
- 1.5 Fixed income: corporate and government
  - 1.5.1 Structure of fixed income securities markets
  - 1.5.2 Types of fixed income securities
  - 1.5.3 Fixed income derivatives
  - 1.5.4 Indices
- 1.6 Futures markets
  - 1.6.1 Function of futures and markets
  - 1.6.2 Basic characteristics of future contracts
  - 1.6.3 Types of futures: commodities, currencies, bond, share price index

- 1.7 Options markets
  - 1.7.1 Function of options
  - 1.7.2 Types of options — commodity, currency, debt, equity and share price index, warrants
- 1.8 Related markets
  - 1.8.1 Currency: market and transactions
  - 1.8.2 Swaps: market and transactions
  - 1.8.3 Property: characteristics and trends
  - 1.8.4 Commodity: types and methods of transaction

## **2. Modern Portfolio Theory**

- 2.1 The risk/return framework
  - 2.1.1 Return
  - 2.1.2 Risk
  - 2.1.3 Measures of risk
  - 2.1.4 Types of risk
- 2.2 Efficient market theory
  - 2.2.1 Definition and assumptions
  - 2.2.2 Alternative hypothesis
  - 2.2.3 Implications
  - 2.2.4 Types of market efficiency
  - 2.2.5 Market anomalies
- 2.3 Portfolio theory
  - 2.3.1 Diversification and portfolio risk
  - 2.3.2 Markowitz model and efficient frontier
  - 2.3.3 Portfolio analysis using higher moments
- 2.4 Capital Asset Pricing Model (CAPM)
  - 2.4.1 Major assumptions
  - 2.4.2 Capital market line (CML)
  - 2.4.3 Security market line (SML)
  - 2.4.4 Zero-beta CAPM
- 2.5 Arbitrage pricing theory
  - 2.5.1 Assumptions
  - 2.5.2 One factor models
  - 2.5.3 Multi-factor models
  - 2.5.4 Arbitrage pricing theory

### **3. Analysis and Valuation of Fixed Income Securities**

- 3.1 Time value of money
  - 3.1.1 Simple vs compound interest
  - 3.1.2 Present and future value
  - 3.1.3 Annuities
  - 3.1.4 Continuous discounting and compounding
- 3.2 Fixed income yield measures
  - 3.2.1 Yield vs discount
  - 3.2.2 Current yield
  - 3.2.3 Yield to maturity
  - 3.2.4 Yield to call
  - 3.2.5 Pricing conventions
  - 3.2.6 Other basic concepts
- 3.3 Term structure of interest rates
  - 3.3.1 Yield curves and shapes
  - 3.3.2 Theories of term structure
  - 3.3.3 Term structure models
- 3.4 Fixed income price analysis
  - 3.4.1 Basic price/yield relationship
  - 3.4.2 Yield spread analysis
  - 3.4.3 Valuation of coupon bonds using zero-coupon prices
- 3.5 Risk measurement
  - 3.5.1 Risk measurement tools
  - 3.5.2 Duration and modified duration
  - 3.5.3 Convexity
  - 3.5.4 Hedging
- 3.6 Credit risk
  - 3.6.1 Industry consideration
  - 3.6.2 Ratio analysis
  - 3.6.3 Credit rating and rating agencies

### **4. Analysis and Valuation of Equity Investments**

- 4.1 Understanding the industry life cycle
- 4.2 Analysing the industry sector and its constituent companies
  - 4.2.1 The industry sector
  - 4.2.2 Characteristics of the industry
  - 4.2.3 Macro factors
  - 4.2.4 Forecasting for companies in the sector
  - 4.2.5 Balance sheet factors
  - 4.2.6 Corporate strategy
  - 4.2.7 Valuations



- 4.3 Understanding the company
  - 4.3.1 Historical financial performance
  - 4.3.2 Segmental information
  - 4.3.3 Inventory, debtors and creditors
  - 4.3.4 Depreciation and amortisation
  - 4.3.5 Completing the forecasts
- 4.4 Valuation models of common stock
  - 4.4.1 Dividend discount model
  - 4.4.2 Free cash flow model
  - 4.4.3 Measures of relative value
- 4.5 Other analytical techniques
  - 4.5.1 Quantitative analysis: what it is
  - 4.5.2 Quantitative analysis: practical examples
  - 4.5.3 Quantitative analysis: alphas and betas
  - 4.5.4 Quantitative analysis: value-added content
  - 4.5.5 Technical analysis
- 5. Analysis of Derivatives and Other Products**
  - 5.1 Futures
    - 5.1.1 Factors determining contract price
    - 5.1.2 Theoretical price of futures
    - 5.1.3 Basis and factors causing change
    - 5.1.4 Arbitrage problems
  - 5.2 Options
    - 5.2.1 Determinants of option price
    - 5.2.2 Options pricing models
    - 5.2.3 Sensitivity analysis of options premiums
    - 5.2.4 Volatility and related topics
    - 5.2.5 Exotic options
  - 5.3 Bonds with warrants
    - 5.3.1 Investment characteristics
    - 5.3.2 Value of warrants
  - 5.4 Convertible bonds
    - 5.4.1 Investment characteristics
    - 5.4.2 Value of conversion benefits
  - 5.5 Callable bonds
    - 5.5.1 Investment characteristics
    - 5.5.2 Valuation and duration

- 5.6 Floating rate notes
  - 5.6.1 Investment characteristics and types
  - 5.6.2 Valuation method
- 5.7 Mortgage-backed securities
  - 5.7.1 Types of mortgages
  - 5.7.2 Types of securities
  - 5.7.3 Factors affecting market price
  - 5.7.4 Valuation methodologies
- 5.8 Asset-backed securities
  - 5.8.1 Types of underlying assets (i.e. collateral)
  - 5.8.2 Cash flow characteristics
  - 5.8.3 Credit enhancement
  - 5.8.4 Valuation methodologies

## **6. Investment Policy**

- 6.1 Investment objectives
  - 6.1.1 Setting investment objectives for individuals
  - 6.1.2 Deciding portfolio structure
  - 6.1.3 Ensuring consistency between objectives at different levels
  - 6.1.4 Setting objectives for institutions
- 6.2 Capital market expectations
  - 6.2.1 Economic, social, political and market factors
  - 6.2.2 Forecasting models
- 6.3 Practical portfolio management
  - 6.3.1 Defining the objectives for component parts of the portfolio
  - 6.3.2 Seeking and briefing investment managers
  - 6.3.3 Meeting the investment manager
  - 6.3.4 Investment management
  - 6.3.5 Monitoring and reviewing investment managers
- 6.4 Specifying the investment mandate
  - 6.4.1 The need for an investment mandate
  - 6.4.2 The mandate
  - 6.4.3 Standard investment management agreement
- 6.5 Practice of portfolio management
  - 6.5.1 Portfolio construction and re-balancing

## **7. Asset Allocation**

- 7.1 Asset allocation overview
  - 7.1.1 What is asset allocation?
  - 7.1.2 Who does asset allocation?
  - 7.1.3 Implementing and managing the asset allocation process
  - 7.1.4 Evolution of asset allocation theory, practice and performance
- 7.2 Type of asset allocation
  - 7.2.1 Integrated asset allocation
  - 7.2.2 Strategic asset allocation
  - 7.2.3 Tactical asset allocation
  - 7.2.4 Dynamic asset allocation
- 7.3 Current issues
  - 7.3.1 Balanced versus specialist manage debate
  - 7.3.2 Role of asset consultants and research houses
  - 7.3.3 Asset allocation in a low inflation environment
  - 7.3.4 Role of government policy in influencing asset allocation decisions

## **8. Practical Portfolio Management**

- 8.1 Managing an equity portfolio
  - 8.1.1 Active management
  - 8.1.2 Passive management
  - 8.1.3 Combined strategies
  - 8.1.4 Portfolio construction based on a factor model
- 8.2 Fixed income portfolio management strategies
  - 8.2.1 Active management
  - 8.2.2 Passive management
  - 8.2.3 Hybrid strategies
  - 8.2.4 Portfolio construction based on a factor model

- 8.3 Derivatives in portfolio management
  - Use in managing portfolios
  - More esoteric uses (eg. swaps to obtain tax effective international exposure)
  - Accounting for and attributing derivatives
  - Cost issues
  - Investment horizon issues
  - Optionality
  - Cost effectiveness gapping risk
  - Implementation
  - Managing a property portfolio
  - The role of property in a diversified portfolio
  - The property investment decision
  - Micro economic influences on property returns
  - Macro economic influences on property returns
  - Difference property investments
  - Managing a portfolio of non-traditional assets
  - What is an alternative asset?
  - Why invest in alternative assets?
  - Infrastructure
  - Analysis of investment in infrastructure
  - Development and venture capital
  - Alternative assets/private capital
  - Unlisted (non-property) securities
  - Terms, conditions and characteristics
  - Role in a traditional portfolio
  - Managing unlisted security vehicles
  - Monitoring and reporting
  - International investments
  - International diversification
  - Hedging foreign exchange risk
  - International equities
  - International fixed interest
  - Managing a portfolio of international assets

## **9. Performance Measurement**

- 9.1 Performance modelling
  - 9.1.1 Monitoring influence of asset allocation on performance
- 9.2 Performance measurement and evaluation
  - 9.2.1 Risk-return measurement
  - 9.2.2 Risk-adjusted performance measures
  - 9.2.3 Relative investment performance
  - 9.2.4 Performance attribution analysis
- 9.3 Monitoring fund performance
  - 9.3.1 Performance measurement
  - 9.3.2 The manager review process
  - 9.3.3 Selection and evaluation of fund managers

## **10. Management of Investment Institutions**

- 10.1 Assessing and choosing managers
  - 10.1.1 Style analysis
  - 10.1.2 Means of style analysis
  - 10.1.3 Style analysis: application to different asset classes equity
  - 10.1.4 Risks, controls and prudential issues: organisational issues
  - 10.1.5 Risks, controls and prudential issues: fee structures



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# Common Knowledge Base

## Part 4

### Corporate Finance

Fundamentals of Corporate Finance

Long-term Finance Decisions

Short-term Finance Decisions

Capital Structure and Dividend Policy

Mergers and Acquisitions

International Corporate Finance

## Corporate Finance

### Broad Learning Objectives

To provide a thorough knowledge of the issues involved in the financing and investment decision and their application in acquisitions, mergers and capital expenditure projects.

### The Common Knowledge Base

#### 1. Fundamentals of Corporate Finance

- 1.1 Goals of corporate firm
  - 1.1.1 Value maximisation of shareholders
  - 1.1.2 Corporate governance issue
- 1.2 The finance function and the firm's objectives
- 1.3 Role of financial manager
- 1.4 Principles of valuation
  - 1.4.1 What is value?
  - 1.4.2 The valuation process
  - 1.4.3 Value creation for shareholders
- 1.5 Discounted cash flow
  - 1.5.1 What is cash flow?
  - 1.5.2 Basics of cash flow analysis
  - 1.5.3 Terminal values
- 1.6 Capital budgeting
  - 1.6.1 Investment decision criteria
  - 1.6.2 Cost of capital
  - 1.6.3 Capital Asset Pricing Model (CAPM)
  - 1.6.4 Capital market line
  - 1.6.5 Security market line

#### 2. Long-term Finance Decisions

- 2.1 Investment decisions
  - 2.1.1 Investment decision criteria
  - 2.1.2 Periodic budgeting
  - 2.1.3 Project evaluation
- 2.2 Project evaluation
  - 2.2.1 The decision process
  - 2.2.2 Methods for ranking investment proposals
  - 2.2.3 Capital resource rationing
  - 2.2.4 Common pitfalls (e.g. sunk costs, depreciation)

- 2.3 Equity
  - 2.3.1 Basic feature of common stock
  - 2.3.2 Retained earnings
  - 2.3.3 Preferred stock
- 2.4 Long-term debt
  - 2.4.1 Bank loans
  - 2.4.2 Corporate bond
- 2.5 Hybrid instruments
  - 2.5.1 Bond with warrants
  - 2.5.2 Convertible bond
- 2.6 Issuing securities
  - 2.6.1 Issuing methods
  - 2.6.2 Issuing equity
  - 2.6.3 Issuing debt
  - 2.6.4 Underwriting of security company
  - 2.6.5 Rights
  - 2.6.6 Dilution
  - 2.6.7 Protective covenants
- 2.7 Liquidation and reorganisation
  - 2.7.1 Bankruptcy liquidation
  - 2.7.2 Bankruptcy reorganisation
  
- 3. Short-term Finance Decisions**
  - 3.1.1 Current asset financing
  - 3.1.2 Short-term financial plan
- 3.2 Credit and cash management
  - 3.2.1 Credit management
  - 3.2.2 Cash management
- 3.3 Short-term lending and borrowing
  - 3.3.1 Short-term lending
  - 3.3.2 Short-term borrowing



## **4. Capital Structure and Dividend Policy**

- 4.1 Leverage and the value of the firm
  - 4.1.1 Modigliani-Miller theory
  - 4.1.2 Bankruptcy cost model
  - 4.1.3 Agency cost model
- 4.2 Dividend policy
  - 4.2.1 Type of dividends (cash dividends, stock dividends and splits)
  - 4.2.2 Repurchase of stock
  - 4.2.3 Irrelevance theorem
  - 4.2.4 Clientele effect
  - 4.2.5 Signaling model
  - 4.2.6 Dividend policy in the local market

## **5. Mergers and Acquisitions**

- 5.1 Valuation issues
  - 5.1.1 Valuation of the target
  - 5.1.2 Tax issues
  - 5.1.3 Issues for the offeror
  - 5.1.4 Motives
- 5.2 Forms of acquisition
  - 5.2.1 Takeovers
  - 5.2.2 Approved acquisitions
  - 5.4.3 Creeping takeovers
  - 5.4.4 Eliminating minority interests
- 5.3 Strategies for the acquirer
  - 5.3.1 Aggressive or agreed
  - 5.3.2 Conditional or unconditional
  - 5.3.3 Timing
  - 5.3.4 Board considerations
- 5.4 Defensive strategies
  - 5.4.1 Pre-emptive vs reactive
  - 5.4.2 Pre-emptive (long-term) strategies
  - 5.4.3 Reactive (short-term) strategies

## **6. International Corporate Finance**

- 6.1 International capital budgeting for multinational firm
  - 6.1.1 Foreign project appraisal
  - 6.1.2 Political risk analysis
  - 6.1.3 Managing Foreign exchange exposure
- 6.2 Discount rate for foreign direct investments

- 6.3 Multinational working capital management
- 6.4 Asset and project finance
  - 6.4.1 Asset-backed securities
  - 6.4.2 Leasing
  - 6.4.3 Project evaluation
  - 6.4.4 Lender's evaluation of the project
  - 6.4.5 Syndication



Certified International  
Investment Analyst

# **Common Knowledge Base**

## **Part 5**

# **Quantitative Analysis and Statistics**

Time Value of Money and Other Mathematical Concepts

Descriptive Statistics

Probability and Statistical Inference

Regression Analysis and Forecasting

Optimization and Other Numerical Procedures

## Quantitative Analysis and Statistics

### Broad Learning Objectives

To understand mathematical concepts (time value of money, etc.), statistical concepts and methods (probability, regression analysis etc.) and numerical procedures (optimization etc.) and to apply these to asset valuation and portfolio management.

### The Common Knowledge Base

#### 1. Time Value of Money and Other Mathematical Concepts

- 1.1 Simple interest and compound interest
  - 1.1.1 Simple interest and compound interest
  - 1.1.2 Future value, present value, discount rate
  - 1.1.3 Total future/present value of annuities
  - 1.1.4 Sum of constantly growing cash flows
  - 1.1.5 IRR, NPV
  - 1.1.6 Interest rates compounded more than once a year (including continuous compounding), stated annual rate and effective annual rate
- 1.2 Calculus and linear algebra
  - 1.2.1 Differential (e.g. derivative, partial and total differential)
  - 1.2.2 Taylor expansion
  - 1.2.3 Matrix and matrix algebra

#### 2. Descriptive Statistics

- 2.1 Frequency distributions (and scatter diagrams)
- 2.2 Mean
  - 2.2.1 Simple and weighted mean
  - 2.2.2 Arithmetic and geometric mean
  - 2.2.3 Mean, mode, median
- 2.3 Dispersion
  - 2.3.1 Variance, standard deviation, coefficient of variation
  - 2.3.2 Range, skewness, kurtosis
  - 2.3.3 Percentiles, Z-scores
- 2.4 Correlation
  - 2.4.1 Covariance, correlation coefficient
  - 2.4.2 Rank correlation
- 2.5 Data collection and analysis
  - 2.5.1 Selection of appropriate dependent and independent variables
  - 2.5.2 Data mining and survivorship bias

### **3. Probability and Statistical Inference**

- 3.1 Probability
  - 3.1.1 Probability theory and concepts
  - 3.1.2 Probability distributions
- 3.2 Sampling and statistical tests
  - 3.2.1 Population and sampling (statistical inference)
  - 3.2.2 Statistical tests
  - 3.2.3 Analysis of variance
  - 3.2.4 Non-parametric tests
  - 3.2.5 Bayesian statistics
- 3.3 Stochastic process
  - 3.3.1 Random walk
  - 3.3.2 Markov process
  - 3.3.3 Binomial process
  - 3.3.4 Poisson process
  - 3.3.5 Wiener process
  - 3.3.6 Ito's lemma

### **4. Regression Analysis and Forecasting**

- 4.1 Regression and correlation analysis
  - 4.1.1 Variables, parameters, statistical measures
  - 4.1.2 Common problems of linear regression
  - 4.1.3 Extension of least square method
  - 4.1.4 Forecasting
- 4.2 Time series analysis and forecasting models
  - 4.2.1 Basic concepts of time series analysis
  - 4.2.2 Forecasting models
- 4.3 Multivariate analysis
  - 4.3.1 Principal component analysis
  - 4.3.2 Factor analysis
  - 4.3.3 Cluster analysis
  - 4.3.4 Discriminant analysis

### **5. Optimization and Other Numerical Procedures**

- 5.1 Optimization
  - 5.1.1 Maximization or minimization under constraints (e.g. Lagrange multiplier method)
  - 5.1.2 Linear programming (LP)
  - 5.1.3 Quadratic programming (QP)
  - 5.1.4 Non-linear programming (NLP), dynamic programming (DP)

- 5.2 Numerical analysis and simulation
  - 5.2.1 Newton method
  - 5.2.2 Finite difference method
  - 5.2.3 Monte Carlo simulation
- 5.3 Non-linear techniques (e.g. chaos, neural nets, genetic algorithms, fuzzy logic)