

Security Analysis and Portfolio Management

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UNIT- I

INVESTMENT AND SECURITY ANALYSIS

Financial Investment

There are numerous components to financial investment

- **Markets:** where assets are bought and sold, and the forms of trade
- **Securities:** the kinds of securities available, their returns and risks
- **Investment process:** the decision about which securities, and how much of each
- **Financial theory:** the factors that determine the rewards from investment (and the risks)

A market is any organized system for connecting buyers and sellers

- There are many security markets
- Markets may have a physical location
- The [New York Stock Exchange](#)
- Or exist only as computer networks
- The [London Stock Exchange](#)
- Markets vary in the securities that are traded and in the way securities are traded

Characteristics of Markets

There are a number of ways to classify markets

- **Primary/Secondary**
- **Primary markets are security markets where new issues of securities are traded**
- **A secondary market is a market where securities are resold**
- **The London Stock Exchange is a secondary market**
- **Most activity on stock exchanges is in the secondary market**

Characteristics of Markets

Trades on the primary market raise capital for firms

- **Trades on the secondary market do not raise additional capital for firms**
- **The secondary market is still important**
- **It gives liquidity to primary issues. New securities would have a lower value if they could not be subsequently traded**
- **It signifies value. Trading in assets reveals information and provides a valuation of the assets. This helps to guide investment decisions**

Characteristics of Markets

A second way to classify markets is the times of trading

- **Call/continuous**
- **In a *call market* trading takes place at a specified time intervals**
- **Some call markets have a provision that limits movement from the prior price. This is to prevent a temporary order imbalance from dramatically moving the price**
- **In a *continuous market* there is trading at all times the market is open**

Characteristics of Markets

Markets can also be characterized by the lifespan of the assets traded

- Money/Capital
- *Money market*: the market for assets with a life of less than 1 year
- *Capital market*: the market for assets with a life greater than 1 year
- Some assets, such as most bonds, have a fixed lifespan
- Common stock have an indefinite lifespan

A broker is a representative appointed by an individual investor

Brokers have two conflicting roles

- *An advisor*: a broker can offer investment advice and information
- *A sales person*: brokers are rewarded through commission and have an incentive to encourage trade
- A *full-service broker* is a brokerage house that can offer a full range of services including investment advice and portfolio management

Brokers

- A discount broker offers a restricted range of services at a lower price
- To complete a trade additional brokers are needed
- A floor broker is located on the floor of the exchange and does the actual buying and selling
- A specialist ensures trade happens by holding an inventory of stock and posting prices

The standard definition of a security is:

"A legal contract representing the right to receive future benefits under a stated set of conditions"

The piece of paper defining the property rights held by the owner is the security

Money market securities

- Short-term debt instruments sold by governments, financial institutions and corporations
- They have maturities when issued of one year or less
- The minimum size of transactions is typically large, usually exceeding \$100,000
- Treasury Bills are the least risky and the most marketable of all money markets instruments
- They represent a short-term IOU of the US federal government
- Similar bills are issued by many other governments

Securities

- **New 91- and 182- day T-bills are issued weekly, by auction whereas 52-week T-bills are issued monthly.**
- **An active secondary market with very low transactions costs exists for trading T-bills**
- **T-bills are sold at a discount from face value and pay no explicit interest payments.**
- **T-bills are considered to have no risk of default, have very short-term maturities, and have a known return**
- **T-bills are the closest approximations that exist to a risk-free investment**

Capital market securities

- Instruments having maturities greater than one year and those having no designated maturity at all
- 1. Fixed income securities
- Fixed income securities have a specified payment schedule
- Bonds promise to pay specific amounts at specific times
- Failure to meet any specific payment puts the bond into default with all remaining payments. The creditor can put the defaulter into bankruptcy

Securities

- **Fixed income securities differ from each other in promised return for several reasons**
- **The maturity of the bonds**
- **The creditworthiness of the issuer**
- **The taxable status of the bond**
- **Income and capital gains are taxed differently in many countries**
- **Bonds are designed to exploit these differences**

1.1 Treasury notes and bonds

- The government issues fixed income securities over a broad range of the maturity spectrum
- Both notes and bonds pay interest twice a year and repay principal on the maturity date

1.2 Corporate bonds

- These promise to pay interest at periodic intervals and to return principal at a fixed date
- These bonds are issued by business entities and thus have a risk of default

2. Common stock (shares, equity)

- Common stock represents an ownership claim on the earnings and assets of a corporation
- After holders of debt claims are paid, the management of the company can either pay out the remaining earnings to stockholdings in the form of dividends or reinvest part or all of the earnings
- The holder of a common stock has limited liability – the most they can lose is the value of the shares

3. Derivative instruments

- Derivative instruments are securities whose value derives from the value of an underlying security or basket of securities
- The instruments are also known as contingent claims, since their values are contingent on the performance of underlying assets
- The most common contingent claims are *options* and *futures*

3.1 An option on a security gives the holder the right to either buy (a call option) or sell (a put option) a particular asset at a future date or during a particular period of time for a specified price

3.2 A *future* is the obligation to buy or sell a particular security or bundle of securities at a particular time for a stated price

- A future is simply a delayed purchase or sale of a security

3.3 The corporation can issue *contingent claims*.

- Corporate-issued contingent claims include rights and warrants, which allow the holder to purchase common stocks from the corporation at a set price for a particular period of time

Indirect investing

- The purchase of a shares of an investment portfolio
- A mutual fund holds a portfolio of securities, usually in line with a stated policy objective.
- Unit trusts invest depositors' funds in bonds or equities. Size is determined by inflow of funds.
- Investment trusts Issue a certain fixed sum of stock to raise capital. This fixed capital is then managed by the trust. The initial investors purchase shares, which are then traded on the stock market
- Hedge funds actively manage deposits in excess of £100,000. Trade in all financial markets, including derivatives.

2. Creditworthiness

- The governments of the US, UK and other developed countries are all judged as safe since they have no history of default in the payment of their liabilities
- Some other countries have defaulted in the recent past
- Corporations vary even more in their creditworthiness. Some are so lacking in creditworthiness that an active "junk bond" market exists for high return, high risk corporate bonds that are judged very likely to default

The Investment Process

A description of the process is:

1. Set investment policy

- Objectives
- Amount
- Choice of assets

2. Conduct security analysis

- Examine securities (identify those which are mispriced?)
- Technical analysis – the examination of past prices for trends
- Fundamental analysis – true value based on future expected returns

The Investment Process

3. Portfolio Construction

- Identify assets
- Choose extent of diversification

4. Portfolio Evaluation

- Assess the performance of portfolio

5. Portfolio Revision

- Repeat previous three steps

Buying Common Stocks

Open an account with a brokerage and specify

1. Name of firm
2. Buy or sell
3. Size of order
4. How long until order is cancelled
5. Type of order

Buying Common Stocks



Time Limit

- **This is the time within which the broker should attempt to fill the order**
- **Day order – fill during the day it is entered or else cancel**
- **Open order (or Good Till Cancelled) – remains in effect until filled or cancelled**
- **Fill-or-kill – cancelled if not executed immediately**
- **Discriminatory order – left to broker**

Buying Common Stocks

Type of Order

Market Order – buy or sell, with broker making best effort

- price uncertain
- execution certain

Limit Order – A limit price is specified

- a maximum if buying
- a minimum if selling
- execution uncertain
- price certain

Buying Common Stocks

Type of Order

Stop Order – a stop price is specified

- **Sell if price falls below the stop price**
- **A stop-loss is used to lock-in profits**
- **Buy if price rises above the stop price**
- **Execution is certain if stop price passed**

Stop Limit Order

- **A minimum price is placed below the stop-price for a sell**
- **A maximum price is placed above the stop-price for a buy**
- **Price is certain within a range**

SECURITY ANALYSIS

Three Steps of Top-Down Fundamental Analysis



Macroeconomic analysis:

- evaluates current economic environment and its effect on industry and company fundamentals

Industry analysis:

- evaluates outlook for particular industries

Company analysis:

- evaluates company's strengths and weaknesses within industry

Business Cycles

- Expansion, Peak, Contraction, Trough
- Impact of Inventory and Final Sales

Economic Indicators

- Leading (10): new orders, building permits, first time unemployment claims, stock prices, rate spreads
- Coincident(4): Non-ag payroll, industrial production
- Lagging (7): Inventory-to-sales, labor cost

Fiscal & Monetary Policy

Fiscal Policy (Keynesians)

- Government expenditures (demand)
- Tax & Debt policies

Monetary Policy (Monetarists – M. Friedman)

- Interest rates (discount, fed funds)
- Money supply (Open market ops): M1, M2
- Reserve requirements (commercial banks)
- Margin requirements (brokerage accounts)

Goals of Policy

Full Employment

- Interest Rates
- Money Supply

Price Stability (control inflation)

- Interest Rates
- Money Supply

Economic Growth

- Interest Rates
- Money Supply

Impediments to Effective Policy

- **Time lags between [stimulus] and [desired effect]**
- **Unintended consequences**
 - i. “irrational” expectations on part of policy makers
 - ii. Adverse influence of speculators
 - iii. Adverse global responses
- **Consumer behavior (rational expectations)**
- **Incorrect analysis, actions, or timing by policy makers**

Classifying industries

- **Cyclical industry** - performance is positively related to economic activity
- **Defensive industry** - performance is insensitive to economic activity
- **Growth industry** - characterized by rapid growth in sales, independent of the business cycle

Industry Life Cycle Theory:

- Birth (heavy R&D, large losses - low revenues)
- Growth (building market share and economies of scale)
- Mature growth (maximum profitability)
- Stabilization (increase in unit sales may be achieved by decreasing prices)
- Decline (demand shifts lead to declining sales and profitability - losses)

Industry Analysis

Life Cycle of an Industry (Marketing view)

- **Start-up stage:** many new firms; grows rapidly (example: genetic engineering)
- **Consolidation stage:** shakeout period; growth slows (example: video games)
- **Maturity stage:** grows with economy (example: automobile industry)
- **Decline stage:** grows lower than economy (example: railroads)

Qualitative Issues

- **Competitive Structure**
- **Permanence (probability of product obsolescence)**
- **Vulnerability to external shocks (foreign competition)**
- **Regulatory and tax conditions (adverse changes)**
- **Labor conditions (unionization)**

Industry Analysis

End use analysis

- identify demand for industry's products
- estimates of future demand
- identification of substitutes

Ratio analysis

- examining data over time
- identifying favorable/unfavorable trends

Regression analysis

- determining the relationship between variables

Company Analysis: Qualitative Issues

- **Sales Revenue (growth)**
- **Profitability (trend)**
- **Product line (turnover, age)**
- **Pricing Strategy**
- **Patents and technology**

Organizational performance

- Effective application of company resources
- Efficient accomplishment of company goals

Management functions

- Planning - setting goals/resources
- Organizing - assigning tasks/resources
- Leading - motivating achievement
- Controlling - monitoring performance

Evaluating Management Quality

- Age and experience of management
- Strategic planning
 - Understanding of the global environment
 - Adaptability to external changes
- Marketing strategy
 - Track record of the competitive position
 - Sustainable growth
 - Public image
- Finance Strategy - adequate and appropriate
- Employee/union relations
- Effectiveness of board of directors

Company Analysis: Quantitative Issues

- **Operating efficiency**
 - **Productivity**
 - **Production function**
- **Importance of Q.A.**
 - **Understanding a company's risks**
 - **Financial, operating, and business risks**
- **Financial Ratio Analysis**
 - **Past financial ratios**
 - **With industry, competitors, and**
- **Regression analysis**
 - **Forecast Revenues, Expenses, Net Income**
 - **Forecast Assets, Liabilities, External Capital Requirements**

➤ Balance Sheet

- Snapshot of company's Assets, Liabilities and Equity.

➤ Income statement

- Sales, expenses, and taxes incurred to operate
- Earnings per share

➤ Cash flow statement

- Sources and Uses of funds
- G.A.A.P. vs **C**leverly **R**igged **A**ccounting **P**loys

➤ Financial Ratio Analysis

- Liquidity (ability to pay bills)
- Debt (financial leverage)
- Profitability (cost controls)
- Efficiency (asset management)

➤ DuPont Analysis

- Top-down analysis of company operations
- Objective: increase ROE

Liquidity Ratios

- **Measure ability to pay maturing obligations**
- **Current ratio**
Current assets / current liabilities
- **Quick ratio**
(Current assets less inventories) / current liabilities

Debt Ratios

- Measure extent to which firm uses debt to finance asset investment (risk attribute)
- Debt-equity ratio
 $\text{Total long-term debt} / \text{total equity}$
- Total debt - total assets ratio
 $(\text{Current liabilities} + \text{long-term debt}) / \text{total assets}$
- Times interest earned
 $\text{EBIT} / \text{interest charges}$
- Fixed charge coverage ratio
 $(\text{EBIT} + \text{Lease Exp.}) / (\text{Int. Exp.} + \text{Lease Exp.})$

Profitability Ratios

- Measure profits relative to sales
- Gross profit margin (%) = Gross profit / sales
- Operating Profit Margin = Operating profits / sales
- Net profit margin = Net profit after taxes / sales
- ROA = Net Profit / Total Assets
- ROE = Net Profit / Stockholder Equity

Efficiency Ratios

- **Measure effectiveness of asset management**
- **Average collection period (in days)**
 - **Average receivables / Sales per day**
- **Inventory turnover (times per year)**
 - **Cost of Goods Sold / average inventory**
- **Total asset turnover**
 - **Sales / average total assets**
- **Fixed asset turnover**
 - **Sales / average net fixed assets**

Other Ratios

- **Earnings per share (EPS):** (Net income after taxes – preferred dividends)/ number of shares
- **Price-earnings (P/E):** Price per share/expected EPS
- **Dividend yield:** Indicated annual dividend/price per share
- **Dividend payout:** Dividends per share/EPS
- **Cash flow per share:** (After-tax profits + depreciation and other noncash expenses)/number of shares
- **Book value per share:** Net worth attributable to common shareholders/number of shares

DuPont Analysis of ROE

$$\text{ROE} = \frac{\text{Net profits after taxes}}{\text{Common stockholders' equity}} = \frac{\text{Net profits}}{\text{Common equity}}$$

$$\text{ROE} = \frac{\text{Net Profits}}{\text{Equity}} = \frac{\text{Net Profits}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity}}$$

Ratio 1 Ratio 2 Ratio 3

- **Two major types of analysis for predicting the performance of a company's stock**
 - fundamental
 - technical
- **Technical**
 - looks for peaks, bottoms, trends, patterns, and other factors affecting a stock's price movement
 - makes a buy/sell decision based on those factors

What is Technical Analysis?

Method of evaluating securities by analyzing statistics generated by

- **Market activity**
- **Past Prices**
- **Volume**

History and Background

- **Technical analysis is, perhaps, the oldest form of security analysis. It is believed that the first technical analysis occurred in 17th century Japan, where analysts used charts to plot price changes in rice.**

History and Background

- **Indeed, many present-day Japanese analysts still rely on technical analysis to forecast prices in their stock exchange, which is the second largest in the world. In the United States, technical analysis has been used for more than 100 years**

Technical Analysis vs. Fundamental Analysis



- **Technical analysis involves the development of trading rules based on past price and volume data for individual stocks and the overall stock market.**
- **Fundamental analysis involves economic, industry, and company analysis that lead to valuation estimates for companies, which can then be compared to market prices to aid in investment decisions.**

Advantages of Technical Analysis

- **Unlike fundamental analysis, technical analysis is not heavily dependent on financial accounting statements**

Advantages of Technical Analysis

- **Fundamental analyst must process new information and quickly determine a new intrinsic value, but technical analyst merely has to recognize a movement to a new equilibrium**
- **Technicians trade when a move to a new equilibrium is underway but a fundamental analyst finds undervalued securities that may not adjust to “correct” prices as quickly**

Challenges to Technical Analysis

➤ Challenges to basic assumptions

- Empirical tests of Efficient Market Hypothesis (EMH) show that prices do not move in trends

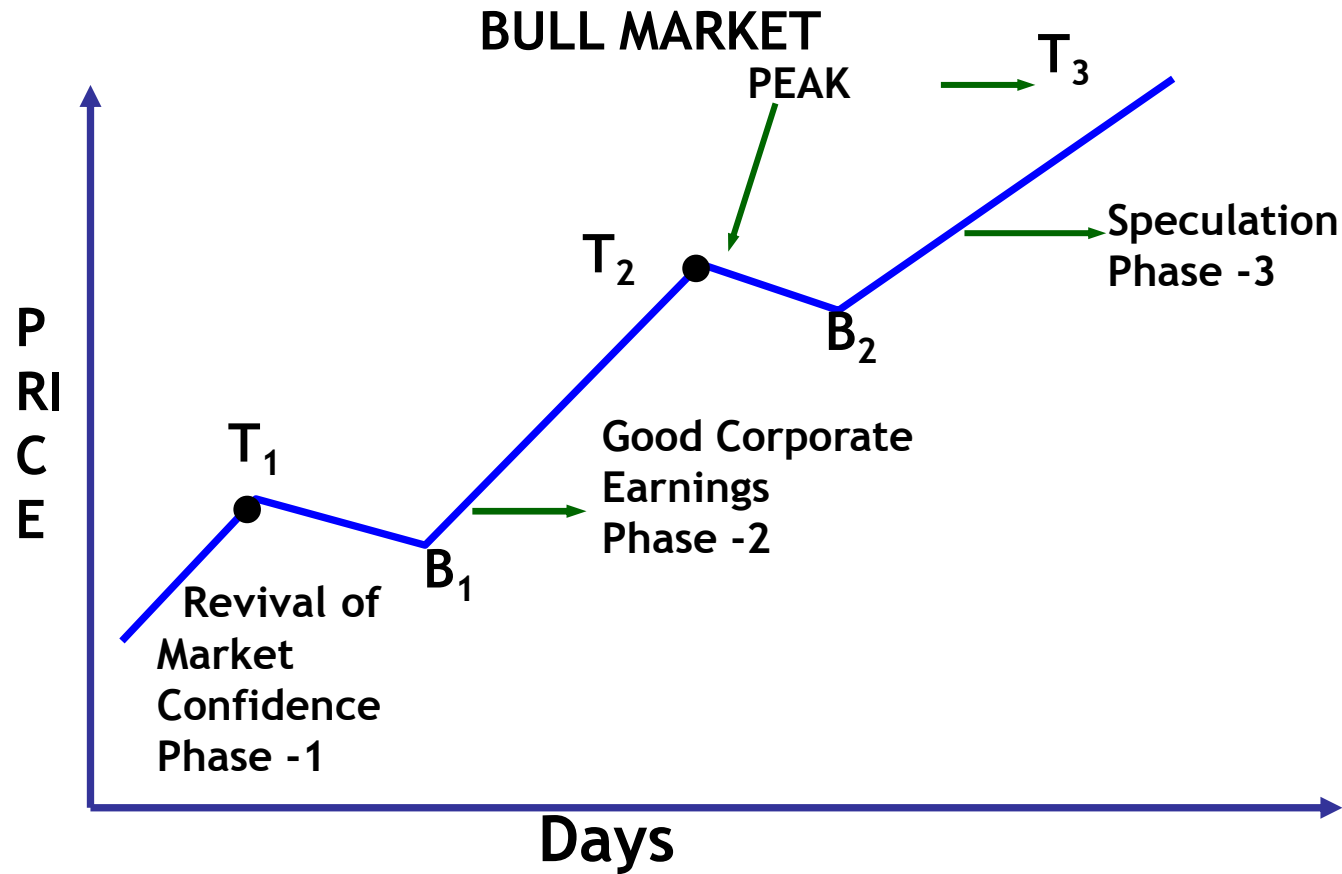
➤ Challenges to technical trading rules

- Rules that worked in the past may not be repeated
- Patterns may become self-fulfilling prophecies
- A successful rule will gain followers and become less successful
- Rules all require subjective judgment

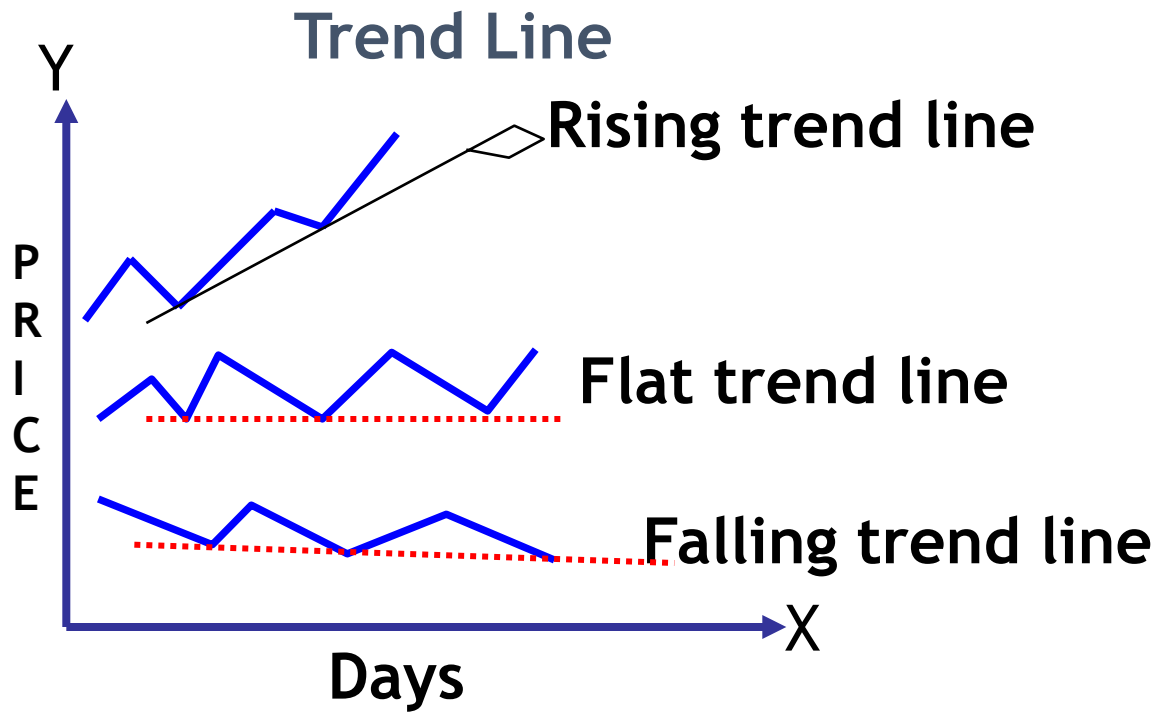
Dow Theory

- **Average discounts everything**
- **Market has three movements**
- **Price action determines trend**
- **Lines indicate movement**
- **Price/Volume relationship provides background**
- **Averages must confirm**

Dow Theory



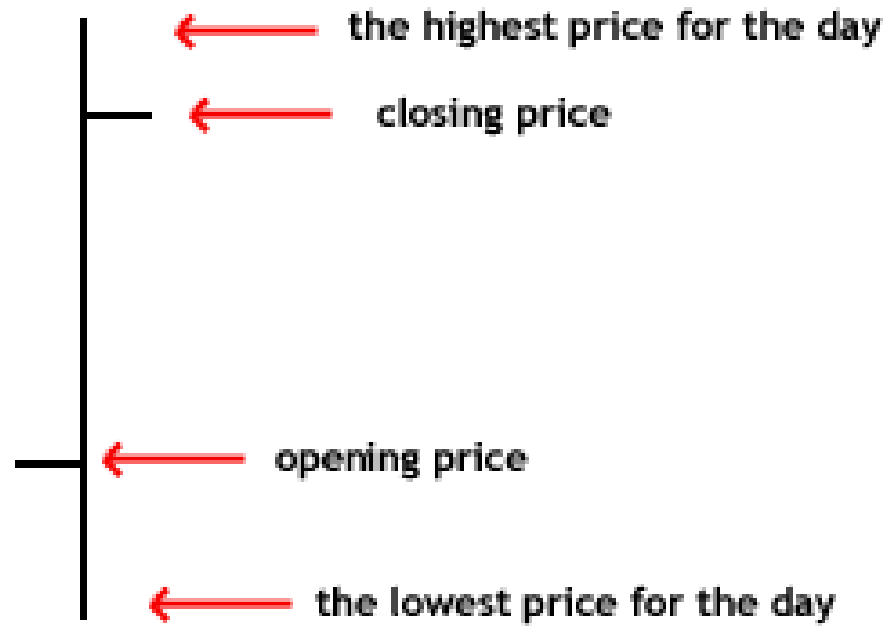
Dow Theory



Types of Charts

- **Bar Chart**
- **Line Chart**
- **Candle Stick Charting**
- **Point and Figure Chart**

The Bar Chart

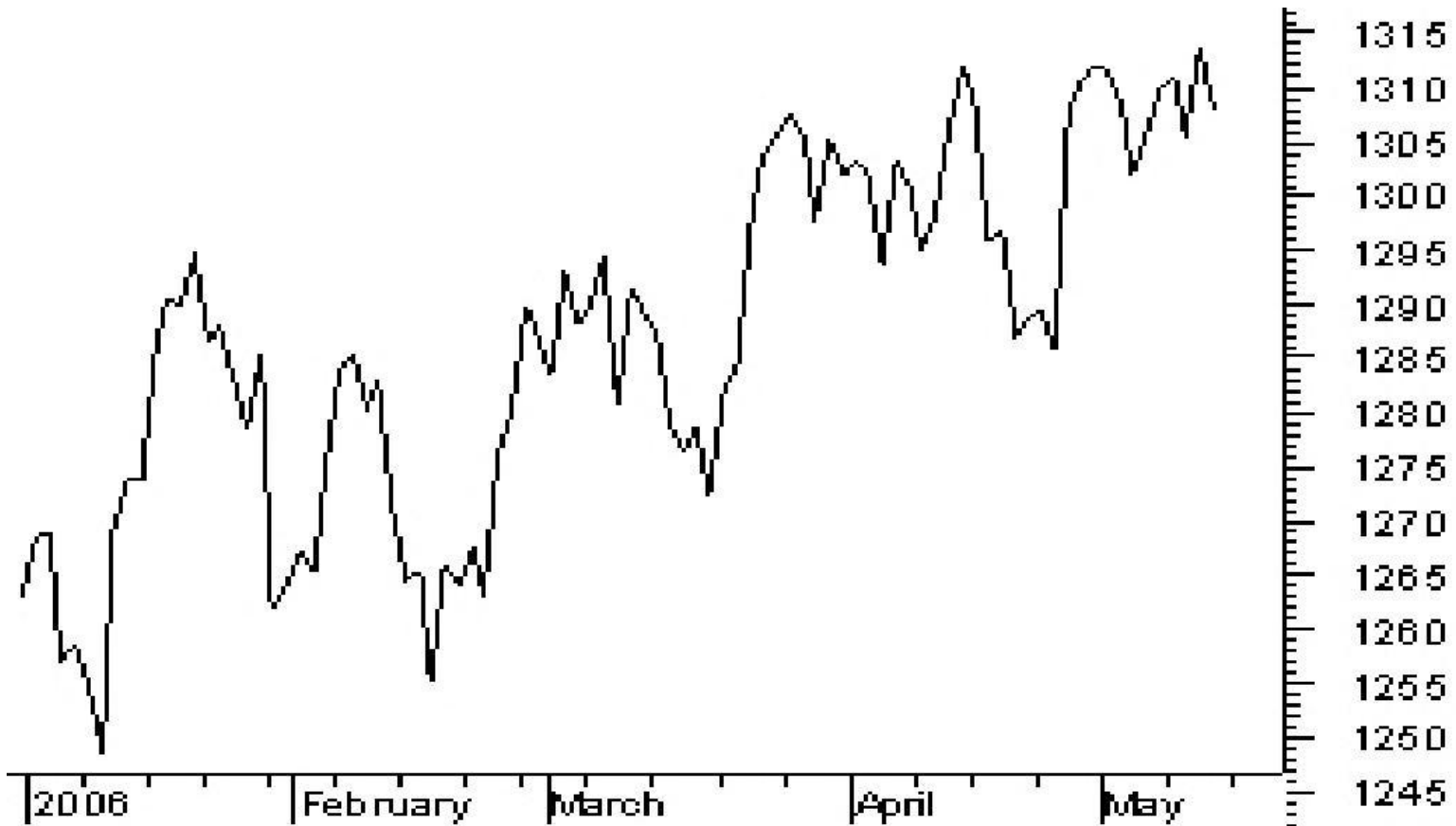


The Bar Chart

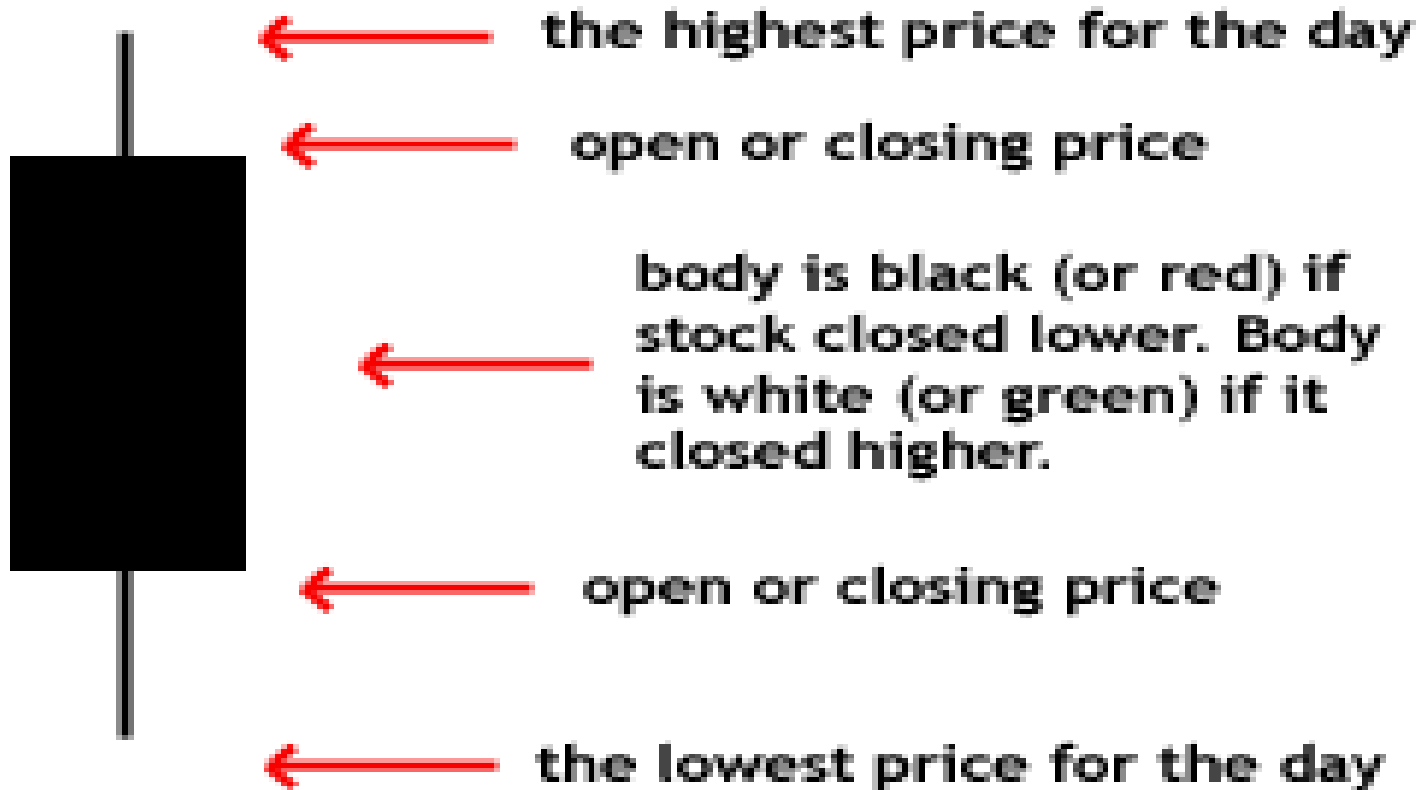
- Some of the most popular type of charts
- Advantage is that it show the high, low, open and close for each day



Line Chart

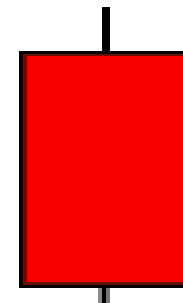


Candle Stick Charting



Candle Stick Charting

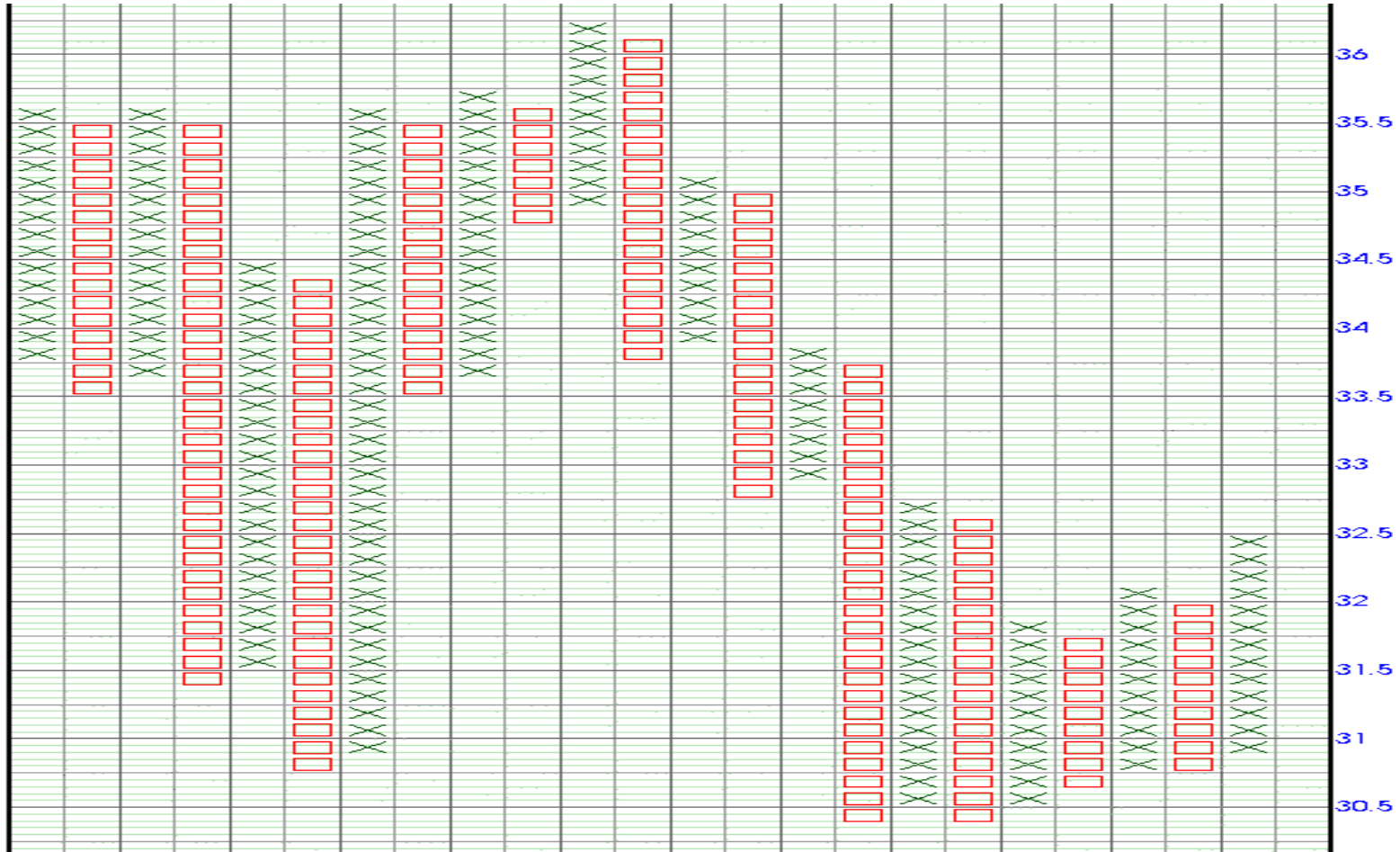
- **Green** is an example of a bullish pattern, the stock opened at (or near) its low and closed near its high
- **Red** is an example of a bearish pattern. The stock opened at (or near) its high and dropped substantially to close near its low



Point and Figure Chart

- Somewhat rare
- Plots day-to-day increases and declines in price.
- A rising stack of XXXX's represents increases
- A rising stack of OOOO's represents decreases.
- Typically used for intraday charting
- If used for multi-day study, only closing prices will be used

Point and Figure Chart



Point and Figure Chart

- **Helps to filter out less-significant price movements allowing analyst to focus on most important trends**
- **Used to keep track of emerging price patterns**
- **Two attributes affecting the appearance of a point & figure chart**

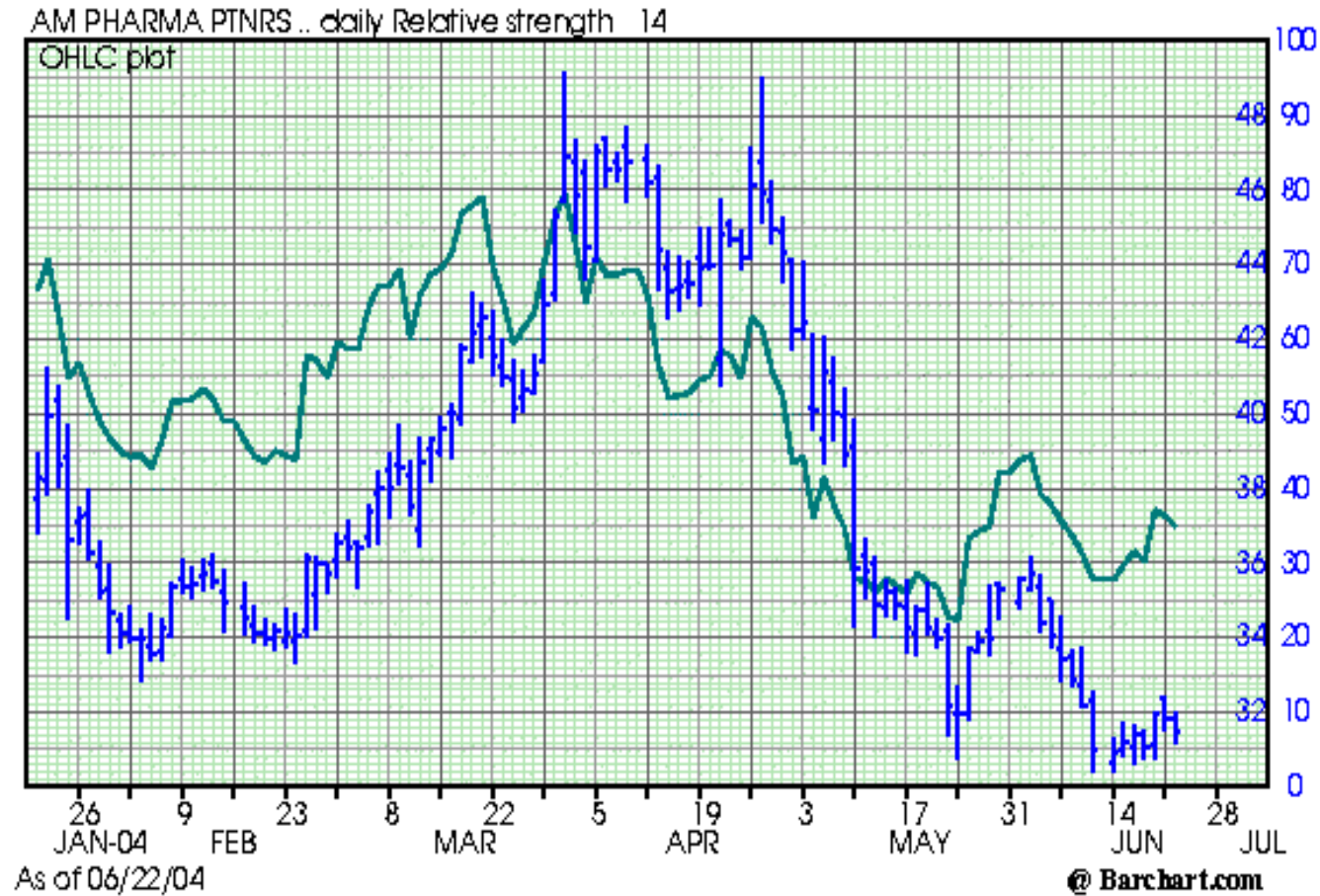
Technical Indicators

- **There are, literally, hundreds of technical indicators used to generate buy and sell signals.**
- **We will look at just a few that I use:**
 - 1. Relative Strength Index (RSI)**
 - 2. On Balance Volume**
 - 3. Bollinger Bands**

Relative Strength Index (RSI)

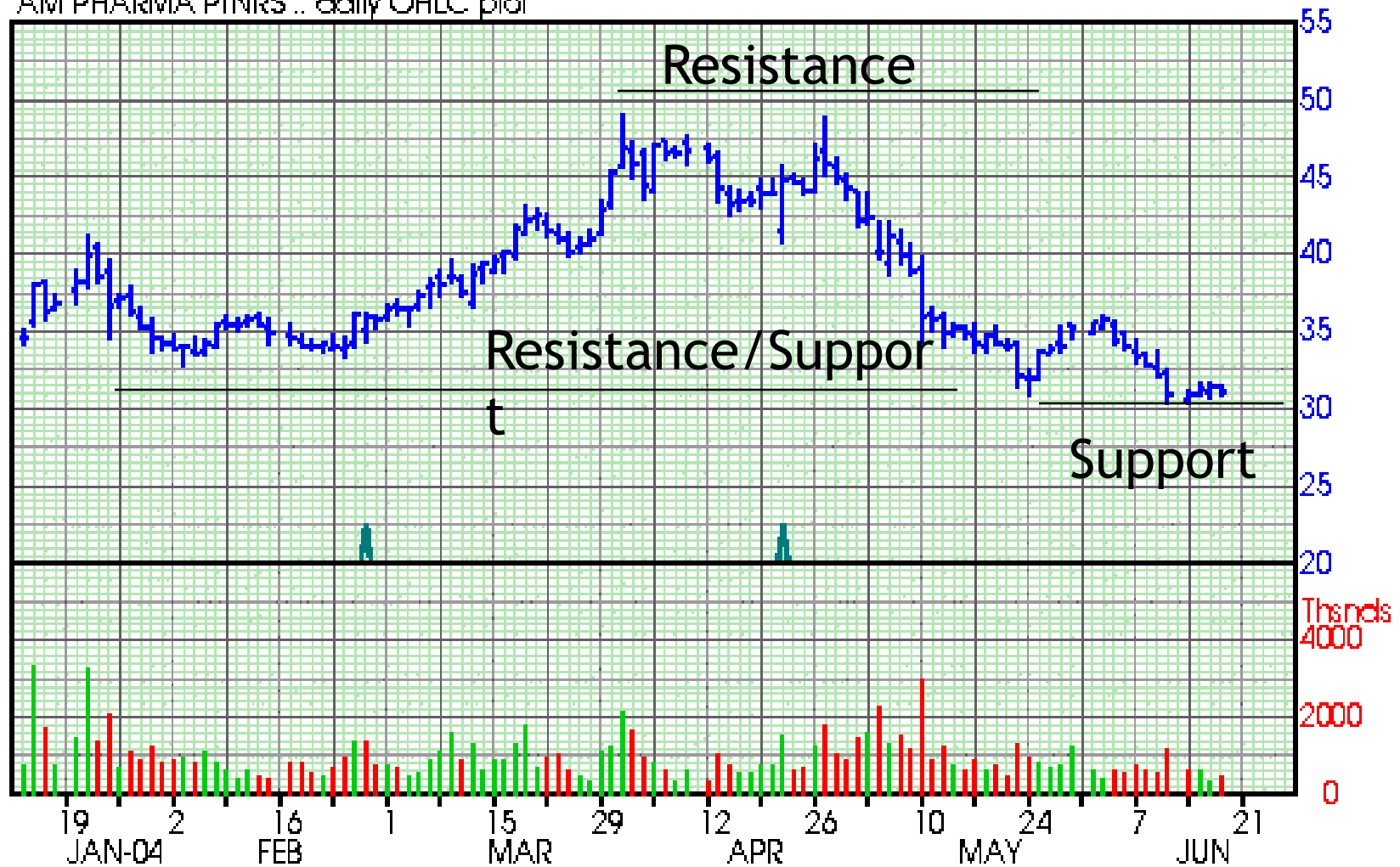
- **A comparison between the days a stock finishes up against the days it finishes down.**
- **Big tool with momentum trading**
- **Ranges from 0 to 100**
 1. **Stock considered overbought around the 70 level**
 2. **Stock considered oversold around 30**
- **The shorter the number of days used to calculate the more volatile**

Relative Strength Index (RSI)



Resistance and Support

AM PHARMA PTNRS .. daily OHLC plot



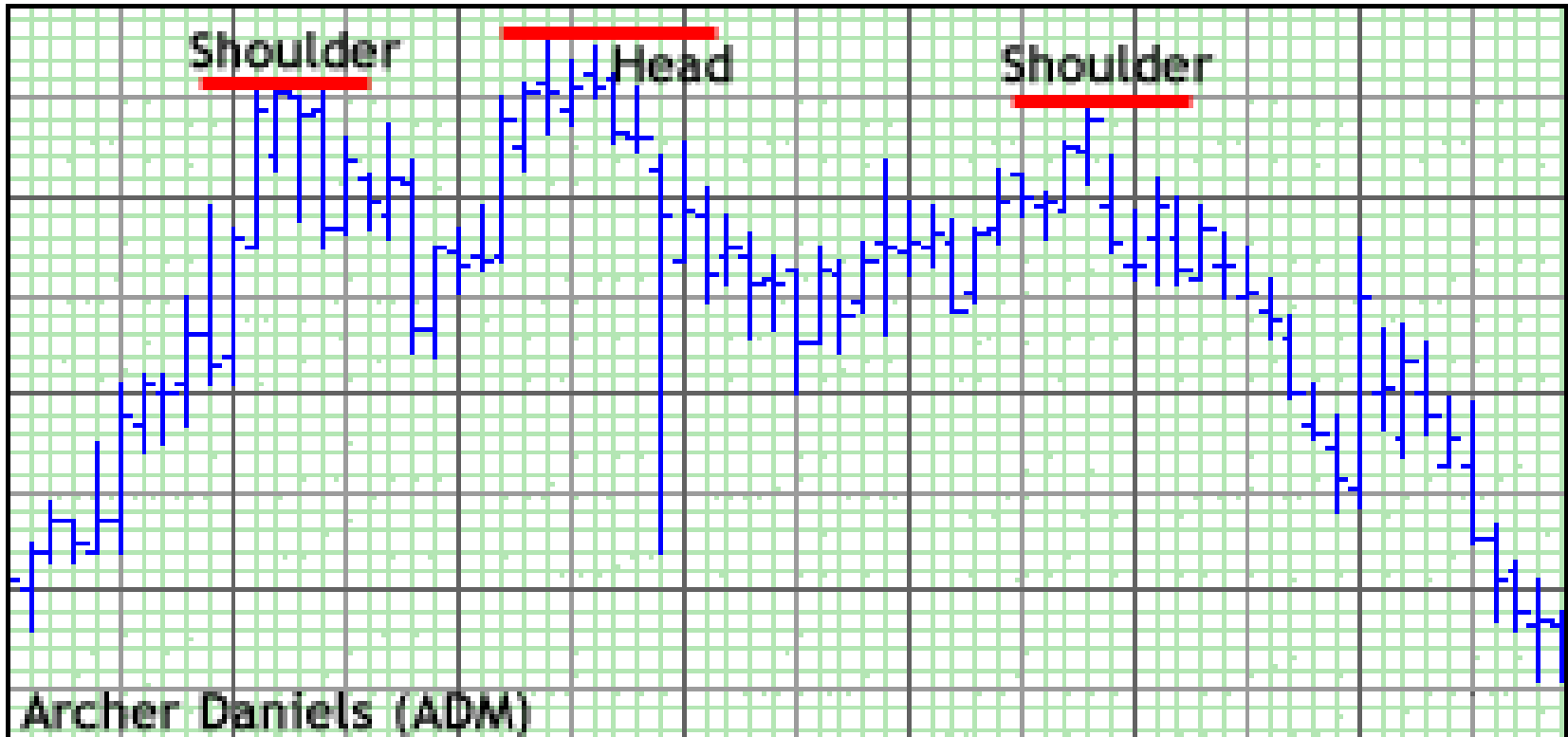
As of 06/17/04

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Head and Shoulders

- Resembles an “M” in which a stock’s price
 1. Rises to a peak and then declines, then
 2. Rises above the former peak and again declines, and then
 3. Rises again but not the second peak and again declines
- The first and third peaks are shoulders, and the second peak forms the head.
- Very bearish indicator

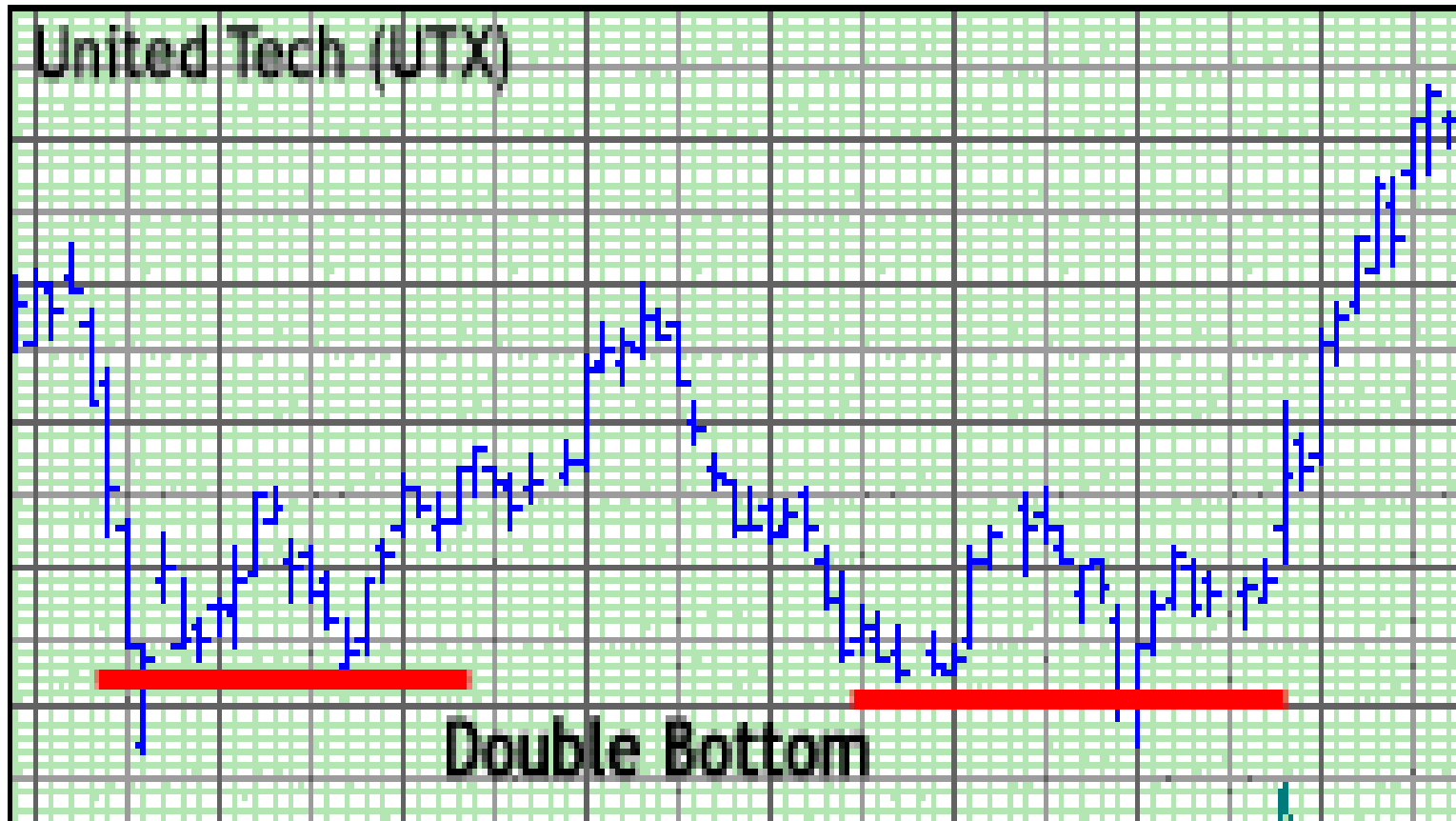
Head and Shoulders



Double Bottom

- Occurs when a stock price drops to a similar price level twice within a few weeks or months
- The double-bottom pattern resembles a “W”
- Buy when the price passes the highest point in the handle.
- In a perfect double bottom, the second decline should normally go slightly lower than the first decline to create a shakeout of jittery investors
- The middle point of the “W” should not go into new high ground.
- This is a very bullish indicator

Double Bottom



UNIT II

PORTFOLIO ANALYSIS

- **The risk inherent in holding a security is the variability, or the uncertainty, of its return**
- **Factors that affect risk are**
 - 1. Maturity**
 - **Underlying factors have more chance to change over a longer horizon**
 - **Maturity value of the security may be eroded by inflation or currency fluctuations**
 - **Increased chance of the issuer defaulting the longer is the time horizon**

2. **Priority**

- Bond holders have the first claim on the assets of a liquidated firm
- Bond holders are also able to put the corporation into bankruptcy if it defaults on payment

3. **Liquidity**

- Liquidity relates to how easy it is to sell an asset
- The existence of a highly developed and active secondary market raises liquidity
- A security's risk is raised if it is lacking liquidity

4. **Underlying Activities**

- The economic activities of the issuer of the security can affect how risky it is
- Stock in small firms and in firms operating in high-technology sectors are on average more risky than those of large firms in traditional sectors

Return and Risk

- **The greater the risk of a security, the higher is expected return**
- **Return is the compensation that has to be paid to induce investors to accept risk**
- **Success in investing is about balancing risk and return to achieve an optimal combination**
- **The risk always remains because of unpredictable variability in the returns on assets**

Return

$$\text{Return} = \frac{\text{end - of - period wealth} - \text{beginning - of - period wealth}}{\text{beginning - of - period wealth}}$$

V_0 **Initial value of investment**

V_1 **Final value of investment**

Return is $r = \frac{V_1 - V_0}{V_0}$

Or as a percentage $r = \frac{V_1 - V_0}{V_0} \times 100$

Return

Example 1

- An initial investment of \$10,000 is made. One year later, the value of the investment has risen to \$12,500. The return on the investment is

$$r = \frac{12500 - 10000}{10000} \times 100 = 25\%$$

Example 2

- An investment initially costs \$5,000. Three months later, the investment is sold for \$6,000. The return on the investment per three months is

$$r = \frac{6000 - 5000}{5000} \times 100 = 20\%$$

Efficient Markets Hypothesis (EMH)

- **Implication: you cannot consistently beat the market**
- **Prices Reflect all information**
 - a. Past (Weak form efficiency)**
 - b. Present or New (Semi-Strong form efficiency)**
 - c. Inside (Strong form efficiency)**
- **Results of Academic Research**
 - a. Markets mostly weak form efficient**
 - b. Several Anomalies question semi-strong**
 - c. Insiders consistently outperform the market**

MPT: 2 Sources of Risk

- a. **Variation**
- b. **Covariance**

Risk Management Strategy

- a. **Hold a diversified portfolio of assets**
- b. **The more assets, the lower the risk**
- c. **Assets are considered in terms of the variance and covariance they add to the portfolio**

Riskiness of a Two-Asset Portfolio

- i. $s_p^2 = w_1^2 s_1^2 + w_2^2 s_2^2 + 2 w_1 w_2 \text{cov}_{1,2}$
- ii. Subject to: $w_1 + w_2 = 1$

Covariance (Correlation [r])

- i. Positively (move in same direction) $r > 0$
- ii. Not at all (zero – no correlation) $r = 0$
- iii. Negatively (move in opposite directions) $r < 0$

Least risk 2-asset portfolio? When $\text{cov}_{1,2} < 0$

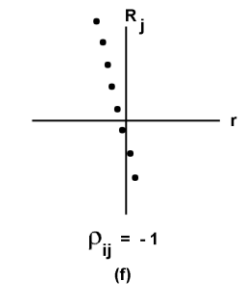
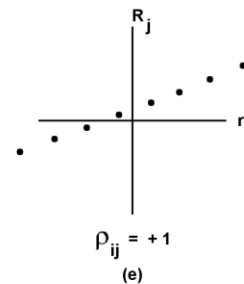
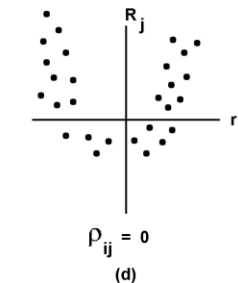
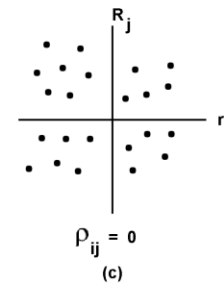
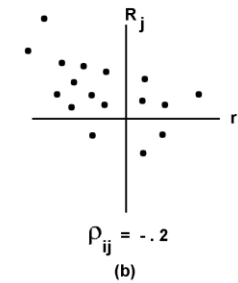
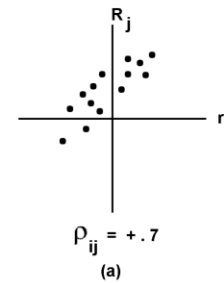
Most risky 2-asset portfolio? When $\text{cov}_{1,2} > 0$

Correlation (2 assets)

- i. Positive
- ii. Negative

Zero (random)

- i. Non-Linear
- ii. Linear



Return on a Two-Asset Portfolio

- $E(R_p) = w_1 E(R_1) + w_2 E(R_2)$

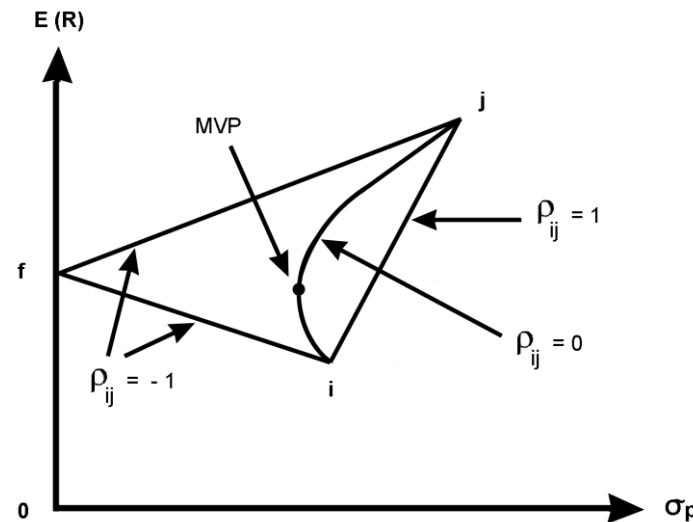
General Form of MPT

- $E(R_p) = \sum w_i E(R_i)$
- $s_p^2 = \sum w_i^2 s_i^2 + \sum \sum w_i w_j \text{COV}_{i,j}$
- Subject to: $\sum w_i = 1$

Efficient Frontier

Locus of all efficient portfolios

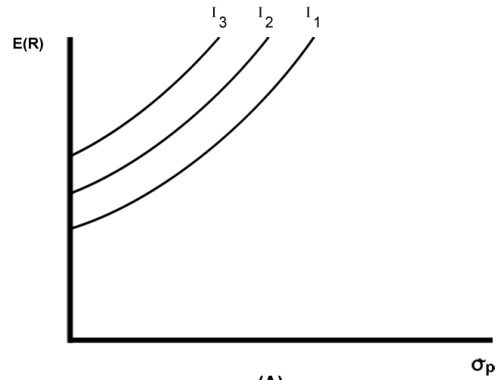
- The shape of the EF is a function of the average correlation of assets in the portfolio
- Portfolios are mean [return] – variance efficient when they place on the EF (see point MVP).



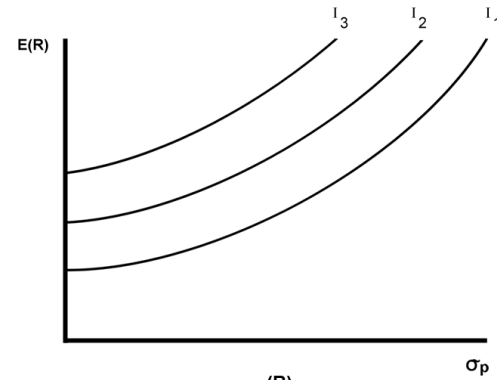
Risk Preferences or Indifference

1. Investors are generally assumed to be risk averse.
 - Prefer less risk to more for a given rate of return
 - Prefer a higher return for a given level of risk
2. Indifference curves tell us something about our utility functions relative to wealth.
 - How much do we value an additional unit of wealth?
 - How much are we willing to risk to obtain it?
 - See Figure 3-8 on page 3.20

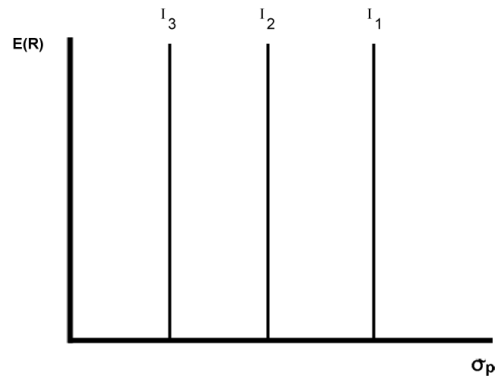
Indifference Curves (Examples)



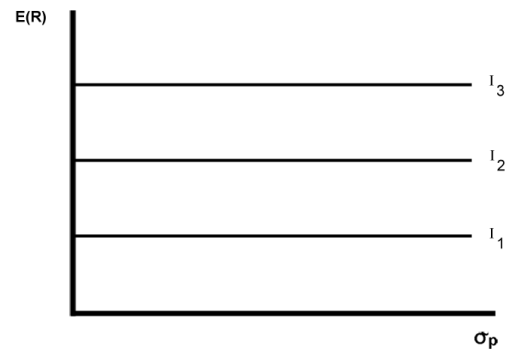
(A)
Timid



(B)
Aggressive

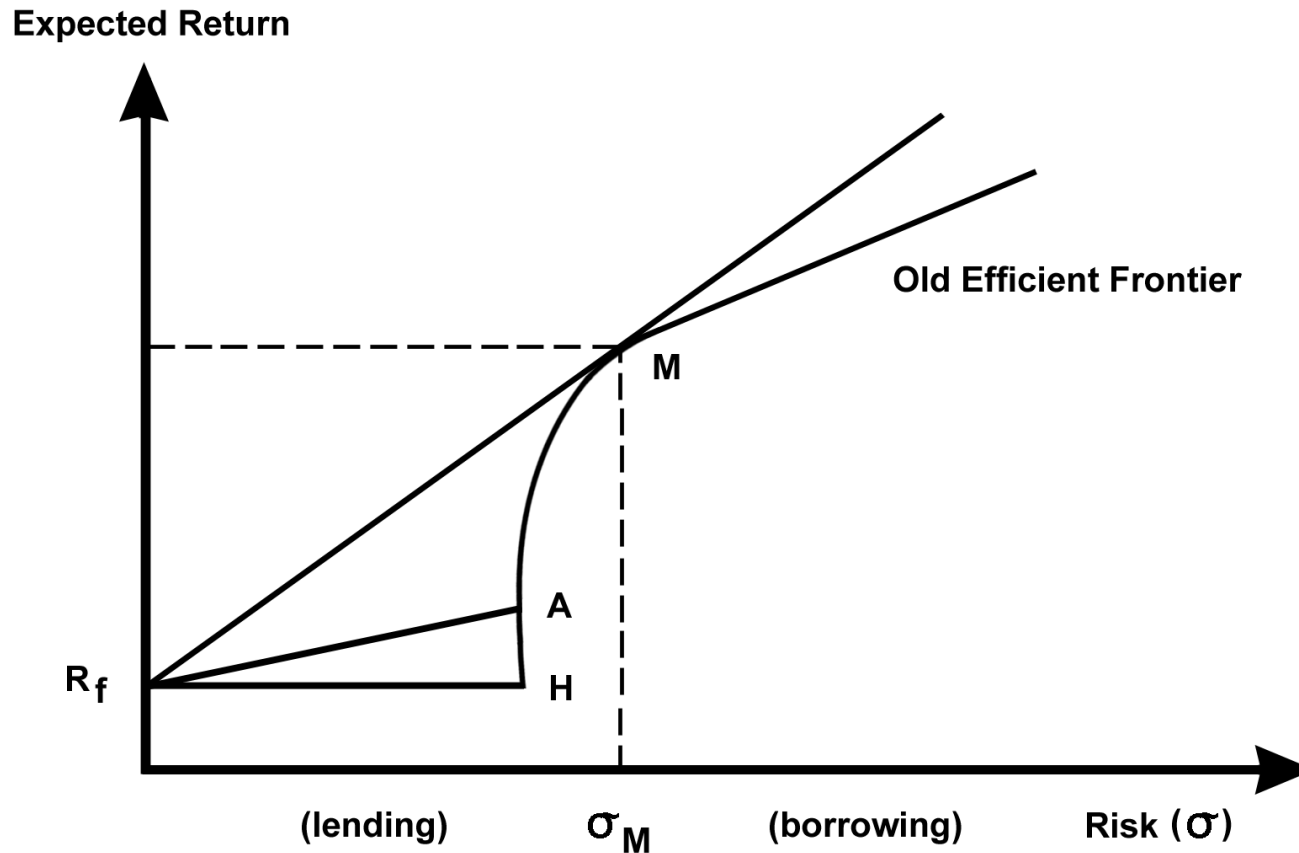


(C)
Phobic



(D)
Maniac

Tobin: Add the Risk-free Asset



Market Portfolio as Construct



Hypothetical portfolio representing each investment asset in the world in proportion to its relative weight in the universe of investment assets

Index Construction

- i. Value weighted**
- ii. Equal weighted**

Separation Theorem

Return to any efficient portfolio and its risk can be completely described by appropriate weighted average of two assets

- 1. the risk-free asset**
- 2. the market portfolio**

Two separate decisions

- 1. What risky investments to include in the market portfolio**
- 2. How one should divide one's money between the market portfolio and risk-free asset**

Capital Asset Pricing Theory (Sharpe)

The concept of *Beta*

- Assuming the existence of a mean and variance efficient market portfolio, how can we construct an portfolio of risky assets with a known risk attribute?
- Beta = a measure of asset risk relative to the market portfolio (M).
- $b = \text{cov}_{i,M} / s_M^2$
- $b = (r_{i,M} s_i) / s_M$

Implications of Beta Value

- **Beta < 0:** moves opposite to the market
- **Beta = 0:** independent of the market
- **0 < Beta < 1:** less risky than market
- **Beta = 1:** risk identical to the market
- **Beta > 1 =>** more risky than market

Estimating Beta (CAPM)

- **b** is a simple OLS regression coefficient
- **General Form:** $y = a + bx + e$
- **OLS:** $R_i = a + b R_M$
- **CAPM:** $E(R_i) = E(R_F) + b \{E(R_M) - E(R_F)\}$
- $\{E(R_M) - E(R_F)\}$ is defined as the risk premium
- **B** is defined as the amount of risk
- $b \{E(R_M) - E(R_F)\}$ is the *price* of risk
- $r_i = r_f + (r_m - r_f) b_i$
- **Portfolio Beta** = $S W_i b_i$

- **The Capital Market Line (CML)**

- **Graphing CAPM for market portfolio**

$$E(R_p) = R_f + \sigma_p \left(\frac{E(R_M) - R_f}{\sigma_M} \right)$$

- **The Security Market Line (SML)**

- **Graphing CAPM for security i**

$$r_i = r_f + (r_m - r_f) \beta_i$$

- **Market Risk vs. Nonmarket Risk**

$$\sigma_i^2 = (\text{beta}^2 \times \sigma_M^2) + \sigma_{\text{eta}}^2$$

Total risk = market risk + nonmarket risk

CAPM Issues

- 1. What return frequency should we use?**
 - Daily, weekly, monthly, quarterly
- 2. What constitutes the market portfolio?**
 - SP500 as a proxy
 - Other proxies yield different β estimates
- 3. Central tendency characteristic of Beta**
- 4. Coefficient of Determination (R^2) varies widely for individual securities.**

Arbitrage Pricing Theory (APT)

Generalized Multi-Factor Pricing Model

- Factors are the Eigen values derived from a variance covariance matrix.
- Factors are said to “load” on economic/market constructs.
- Biggest problem is the nature and reliability of loading.

$$E(R_i) = \alpha_i + \beta_{i1}F_1 + \beta_{i2}F_2 + \dots + \beta_{iM}F_M$$

UNIT III

BOND ANALYSIS AND VALUATION AND MANAGEMENT

Unit-III: Characteristics of Bonds

Bonds: debt securities that pay a rate of interest based upon the face amount or par value of the bond.

- **Price changes as market interest changes**
- **Interest payments are commonly semiannual**
- **Bond investors receive full face amount when bonds mature**
- **Zero coupon bonds – no periodic payment (no interest reinvestment rate)**



Bond Pricing

- **Present of the Bond = Present value of interest payments + Present Value of Principal**

→ **PV of Annuity (pmt, I, N) + PV (FV, I, N)**

$$PV = \sum_{t=1}^N \frac{PMT}{(1+i)^t} + \frac{FV}{(1+i)^N}$$

Where N = time to maturity

i = market interest rate

PMT = semiannual interest payment

FV = face value

Bond price calculation

The bond pays \$25 semiannual coupon payment Maturity: three years and one month Market interest rate: 6% (APR)

Solution:

Using financial calculator

$$N = 2 \times 3 \frac{1}{12} = 6.167 \text{ yrs}$$

$$I/Y = 6\% / 2 = 3\%$$

$$PMT = 25$$

$$FV = \$1,000$$

$$PV = \$972.23$$

Callable Bonds

- **Call provision allows the issuer to repay the investors' principal early.**
- **Issuers call the bond when they want to refinance their debt at the lower interest rate**
- **Call price is commonly the face value plus one year of interest payments.**
- **Call protection: amount of the time before the bond becomes callable.**

Expected yield Calculation

Yield to maturity (or yield to call): expected total rate of return if investor were to buy and hold the bond until maturity or until call date.

- **Internal rate of return of the bond that equates the present value of the cash flow with the price of the bond.**

Solve for I in

$$\text{Bond price} = \text{PV of Annuity (pmt, I, N)} + \text{PV (FV, I, N)}$$

Example:

The bond pays \$25 every six months.

The bond matures in 3 years and one month.

Price of the bond is \$972.23.

What is the bond's yield to maturity?

Solution:

Using financial calculator

$N = 6.167$ $PV = -972.23$ $PMT = 25$ $FV = 1,000$

$i = 3\%$ (or 6% annually)

Interest rate risk

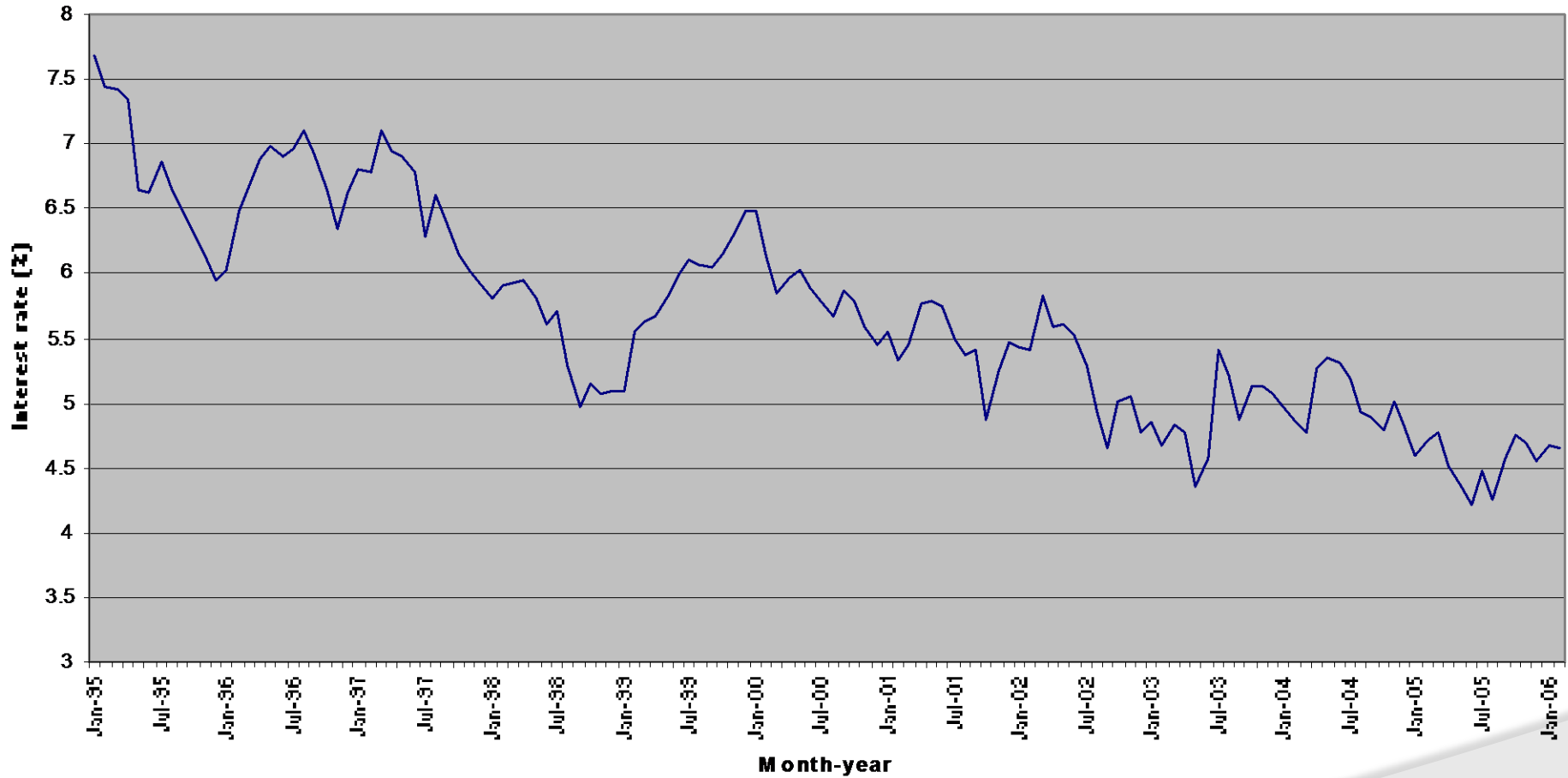
- Bond prices are sensitive to the market interest rate
- If interest rates rise, the market value of bonds fall in order to compete with newly issued bonds with higher coupon rates.
- Sensitivity to the interest rate change become more severe for longer term bonds
- Percentage rise in price is not symmetric with percentage decline.



Table 15.3 **An Illustration of Interest-rate Risk for Treasury Securities With a 6% Coupon Selling at Par of \$1,000**

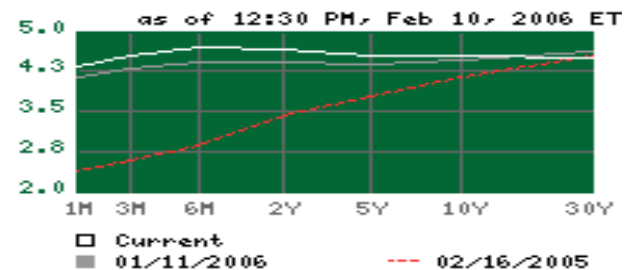
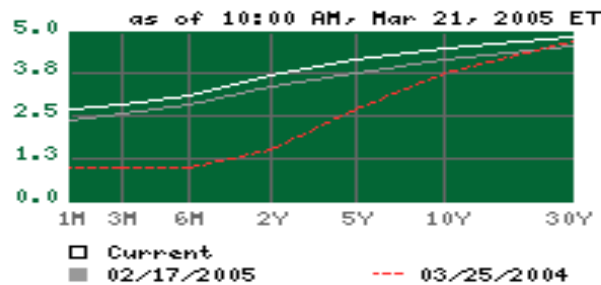
Bond Type	Term to Maturity (years)	Decline in bond value following an increase in rates			Rise in bond value following a decrease in rates		
		→			→		
		1%	2%	3%	-1%	-2%	-3%
Treasury bill	Six months	0%	0%	0%	0%	0%	0%
Treasury note	2	-1.84%	-3.63%	-5.38%	1.88%	3.81%	5.78%
Treasury note	5	-4.16%	-8.11%	-11.87%	4.38%	8.98%	13.83%
Treasury bond	10	-7.11%	-13.59%	-19.51%	7.79%	16.35%	25.75%
Treasury bond	20	-10.68%	-19.79%	-27.60%	12.55%	27.36%	44.87%
Treasury bond	30	-12.47%	-22.62%	-30.96%	15.45%	34.76%	59.07%

Figure 15.1 Market Interest Rates for 30-year U.S. Treasury Bonds, 1995-present



Term structure of interest rate

- **Yield curve: line describing the relationship between yield to maturity and term to maturity**



- **Liquidity preference hypothesis: long term yield is greater because investors prefer the liquidity in short term issues.**
- **Segmented market hypothesis: yield curve reflects the hedging and maturity needs of institutional investors**

Duration

- **Term to maturity is an imperfect measure of bond risk because it ignores the valuation effects of differences in coupon rate and principal payment schedule**
- **Duration: an estimate of economic life of a bond measured by the weighted average time to receipt of cash flows**

Duration (or Maculay duration) calculation

$$\text{Duration} = \frac{\sum_{t=1}^T \frac{t \times \text{Cash Payment}_t}{(1 + \text{Yield})^{t_j}}}{\sum_{t=1}^T \frac{\text{Cash Payment}_t}{(1 + \text{Yield})^{t_j}}} = \frac{\sum_{t=1}^T \frac{t \times \text{Cash Payment}_t}{(1 + \text{Yield})^{t_j}}}{\text{Bond Price}}$$

Example: Calculate duration for a 7.5% bond with 5 years to maturity and a yield of 6.75%.

$$\text{Duration} = \left(\frac{0.5 \times \$37.50}{1.0675^{0.5}} + \frac{1 \times \$37.50}{1.0675^1} + \frac{1.5 \times \$37.50}{1.0675^{1.5}} + \dots + \frac{4.5 \times \$37.50}{1.0675^{4.5}} + \frac{5 \times (\$37.50 + \$1,000)}{1.0675^5} \right) \div \$1,031.40 = 4.3 \text{ years}$$

$$\text{Modified duration} = \frac{\text{Duration}}{1 + \left(\frac{\text{Yield}}{\text{Coupon Payments per Year}} \right)}$$

- **Direct estimate of the percentage change in bond price for each percentage point change in the market interest rate.**

$$\% \text{ change in bond price} = -1 \times \% \text{ Yield change} \times \text{modified duration}$$

Example: given that duration is 4.3 yrs, if interest rates fall by 0.5% what is the change in the bond price?

$$\text{Modified duration} = 4.3 / (1.0337) = 4.16$$

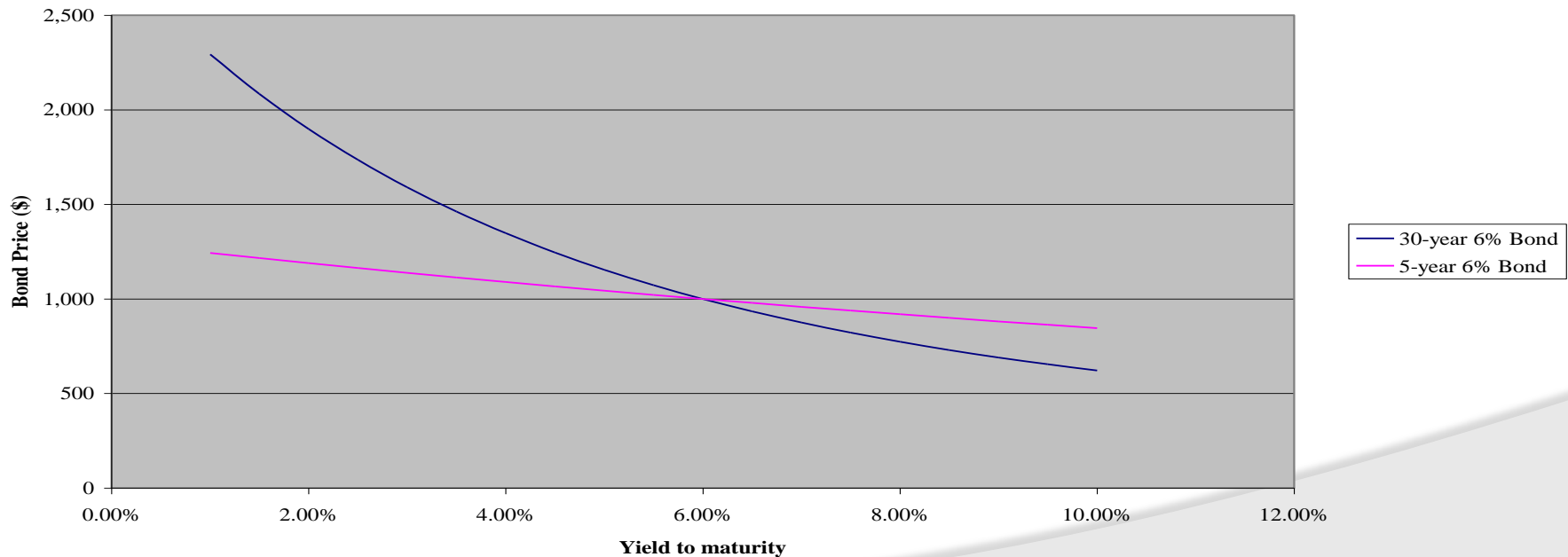
$$\% \text{ change in price} = -1 \times (-0.5\%) \times 4.16 = 2.08\%$$

Convexity

- **Convexity measures the sensitivity of modified duration to changes in interest rate (the rate of “acceleration” in bond price changes)**

The degree of bend in the price–yield curve

Figure 15.3 The Price-yield Curve for a 30-year 6% Bond is More Convex to the Origin than the Price-yield Curve for a 5-year 6% Bond



Bond pricing using convexity and duration

$$\text{Convexity} = \frac{\sum_{t=1}^T \frac{(t^2 + t) \times \text{Cash Payment}_t}{(1 + \text{Yield})^{t_j}}}{\text{Bond Price} \times (1 + \text{Yield})^2}$$

- **% bond price change = - 1 × % Yield change × modified duration + ½ × convexity × (Yield change)²**
- **Using both duration and convexity allows for a more accurate estimation**

- **Example:**

Compute the convexity for the 7.5% bond with 5 years to maturity and a yield of 6.75%.

$$\text{Convexity} = \frac{\left(\frac{(0.5^2 + 0.5) \times \$37.50}{1.0675^{0.5}} + \frac{(1^2 + 1) \times \$37.50}{1.0675^1} + \dots + \frac{(4.5^2 + 4.5) \times \$37.50}{1.0675^{4.5}} + \frac{(5^2 + 5) \times (\$37.50 + \$1,000)}{1.0675^5} \right)}{\$1,031.40 \times (1.0675)^2} = 21.49$$

- **% change in bond price :**

$$- (-0.005) \times 4.16 + \frac{1}{2} \times 21.49 \times (-0.005)^2 = 2.11\%$$

(% change approximation using only duration was 2.08%)

Convertible bonds

- **A special type of bond that can be exchanged into some more junior grade of securities (usually into common stock)**
- **Conversion value = # of equivalent common shares multiplied by the current share price**
- **Premium to conversion = % over conversion value at which the convertible trades**
- **Break even time = # of years needed to recover the conversion premium with the convertible's higher income**

Example:

A common stock pays a 35¢ dividend and has a price of \$55/share. The company also has 6% convertible bond selling at 118% of the par value, convertible into common at \$50/share. What is the conversion ratio, conversion value, and premium to convert?

Solution:

The conversion ratio is $\$1,000/\$50 = 20:1$.

The conversion value is $20 \times \$55 = \$1,100$.

The premium to convert is $\$1,180 - \$1,100 = \$80$.

- Interest from convertible bond: \$60
- Dividend from stocks when converted: \$7
- Therefore, holding convertible yields higher income.

Bond Investment Strategies



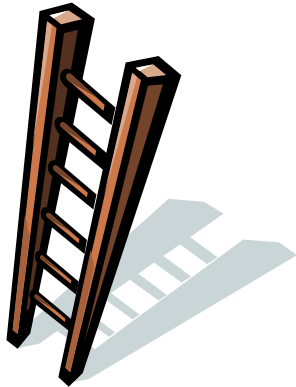
Why invest in bonds?

- **Stable income and diversification**

Asset allocation: the process of diversifying an investment portfolio across various asset categories, like stocks and bonds and cash to balance the risk/reward tradeoff.

- **Prime benefit: the risk reduction**
- **Even modest amount of diversification can sharply dampen portfolio risk**

Maturity-Based Strategies



- **Laddering:** for an investor who seeks greater interest income with minimum price volatility
 - Construct a portfolio using bonds with a series of targeted maturities, resembling a bond maturity “ladder”

- **Barbell strategy:** concentrates on both very short term and very long term bonds (six month T-bill and 30 year T-bonds)
- **Bond swap:** the simultaneous sale and purchase of fixed income securities



UNIT IV

EQUITY VALUATION AND DERIVATIVES

Valuation: Fundamental Analysis



- **Fundamental analysis models a company's value by assessing its current and future profitability.**
- **The purpose of fundamental analysis is to identify mispriced stocks relative to some measure of "true" value derived from financial data.**

Models of Equity Valuation



- **Balance Sheet Models**
- **Dividend Discount Models (DDM)**
- **Price/Earnings Ratios**
- **Free Cash Flow Models**

Valuation by Comparables



- **Compare valuation ratios of firm to industry averages.**
- **Ratios like price/sales are useful for valuing start-ups that have yet to generate positive earnings.**

Limitations of Book Value



- **Book values are based on historical cost, not actual market values.**
- **It is possible, but uncommon, for market value to be less than book value.**
- **“Floor” or minimum value is the liquidation value per share.**
- **Tobin’s q is the ratio of market price to replacement cost.**

Intrinsic Value vs. Market Price



- The return on a stock is composed of dividends and capital gains or losses.

$$\text{Expected HPR} = E(r) = \frac{E(D_1) + [E(P_1) - P_0]}{P_0}$$

- The expected HPR may be more or less than the required rate of return, based on the stock's risk.

Required Return

- CAPM gives the required return, k :

$$k = r_f + \beta \left[E(r_M) - r_f \right]$$

- If the stock is priced correctly, k should equal expected return.
- k is the market capitalization rate.

Intrinsic Value and Market Price



- The intrinsic value (IV) is the “true” value, according to a model.
- The market value (MV) is the consensus value of all market participants

Trading Signal:

$IV > MV$ Buy

$IV < MV$ Sell or Short Sell

$IV = MV$ Hold or Fairly Priced

Dividend Discount Models (DDM)

$$V_0 = \frac{D_1}{1+k} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \dots$$

- V_0 = current value; D_t = dividend at time t ; k = required rate of return
- The DDM says the stock price should equal the present value of all expected future dividends into perpetuity.

Constant Growth DDM

$$V_0 = \frac{D_0(1+g)}{k-g} = \frac{D_1}{k-g}$$

g=dividend growth rate

Preferred Stock and the DDM



- No growth case
- Value a preferred stock paying a fixed dividend of \$2 per share when the discount rate is 8%:

$$V_o = \frac{\$2}{0.08 - 0} = \$25$$

Constant Growth DDM

- A stock just paid an annual dividend of \$3/share. The dividend is expected to grow at 8% indefinitely, and the market capitalization rate (from CAPM) is 14%.

$$V_0 = \frac{D_1}{k - g} = \frac{\$3.24}{.14 - .08} = \$54$$

DDM Implications

- The constant-growth rate DDM implies that a stock's value will be greater:
 1. The larger its expected dividend per share.
 2. The lower the market capitalization rate, k .
 3. The higher the expected growth rate of dividends.
- The stock price is expected to grow at the same rate as dividends.

$$g = ROE \times b$$

g = growth rate in dividends

ROE = Return on Equity for the firm

**b = plowback or retention percentage rate
(1- dividend payout percentage rate)**

Present Value of Growth Opportunities



- The value of the firm equals the value of the assets already in place, the no-growth value of the firm,
- Plus the NPV of its future investments,
- Which is called the present value of growth opportunities or PVGO.

Present Value of Growth Opportunities



- Price = No-growth value per share + PVGO

$$P_0 = \frac{E_1}{k} + PVGO$$

Growth Opportunities

- Firm reinvests 60% of its earnings in projects with ROE of 10%, capitalization rate is 15%. Expected year-end dividend is \$2/share, paid out of earnings of \$5/share.
- $g = \text{ROE} \times b = 10\% \times .6 = 6\%$

$$P_0 = \frac{\$2}{.15 - .06} = \$22.22$$

Growth Opportunities

$$P_0 = \frac{\$2}{.15 - .06} = \$22.22$$

- **PVGO = Price per share – no-growth value per share**

$$PVGO = \$22.22 - \frac{\$5}{.15} = -\$11.11$$

- **Expected dividends for Honda:**

2010 \$.50	2012 \$.83
2011 \$.66	2013 \$ 1.00
- **Since the dividend payout ratio is 30% and ROE is 11%, the “steady-state” growth rate is 7.7%.**

Honda Example

- Honda's beta is 0.95 and the risk-free rate is 3.5%. If the market risk premium is 8%, then k is:
- $k = 3.5\% + 0.95(8\%) = 11.1\%$
- Therefore:

$$P_{2013} = \frac{D_{2014}}{k - g} = \frac{D_{2013}(1 + g)}{k - g} = \frac{\$1(1.077)}{0.111 - 0.077} = \$31.68$$

Honda Example

- **Finally,**

$$V_{2009} = \frac{\$0.50}{1.111} + \frac{\$0.66}{1.111^2} + \frac{\$0.83}{1.111^3} + \frac{\$1 + \$31.68}{1.111^4}$$

- **In 2009, one share of Honda Motor Company Stock was worth \$23.04.**

Price-Earnings Ratio and Growth

- The ratio of PVGO to E / k is the ratio of firm value due to growth opportunities to value due to assets already in place (i.e., the no-growth value of the firm, E / k).

$$\frac{P_0}{E_1} = \frac{1}{k} \left(1 + \frac{PVGO}{E/k} \right)$$

Price-Earnings Ratio and Growth

- When $PVGO=0$, $P_0=E_1 / k$. The stock is valued like a non growing perpetuity.
- P/E rises dramatically with PVGO.
- High P/E indicates that the firm has ample growth opportunities.

Price-Earnings Ratio and Growth

P/E increases:

- As ROE increases
- As plowback increases, as long as $ROE > k$

$$\frac{P_0}{E_1} = \frac{1-b}{k - ROE \times b}$$

P/E and Growth Rate

- **Wall Street rule of thumb: The growth rate is roughly equal to the P/E ratio.**
- **“If the P/E ratio of Coca Cola is 15, you’d expect the company to be growing at about 15% per year, etc. But if the P/E ratio is less than the growth rate, you may have found yourself a bargain.”**

Quote from Peter Lynch in One Up on Wall Street.

P/E Ratios and Stock Risk



- When risk is higher, k is higher; therefore, P/E is lower.

$$\frac{P}{E} = \frac{1 - b}{k - g}$$

Pitfalls in P/E Analysis



- **Use of accounting earnings**
 - I. **Earnings Management**
 - II. **Choices on GAAP**
- **Inflation**
- **Reported earnings fluctuate around the business cycle**

P/E Ratios for Different Industries, 2007

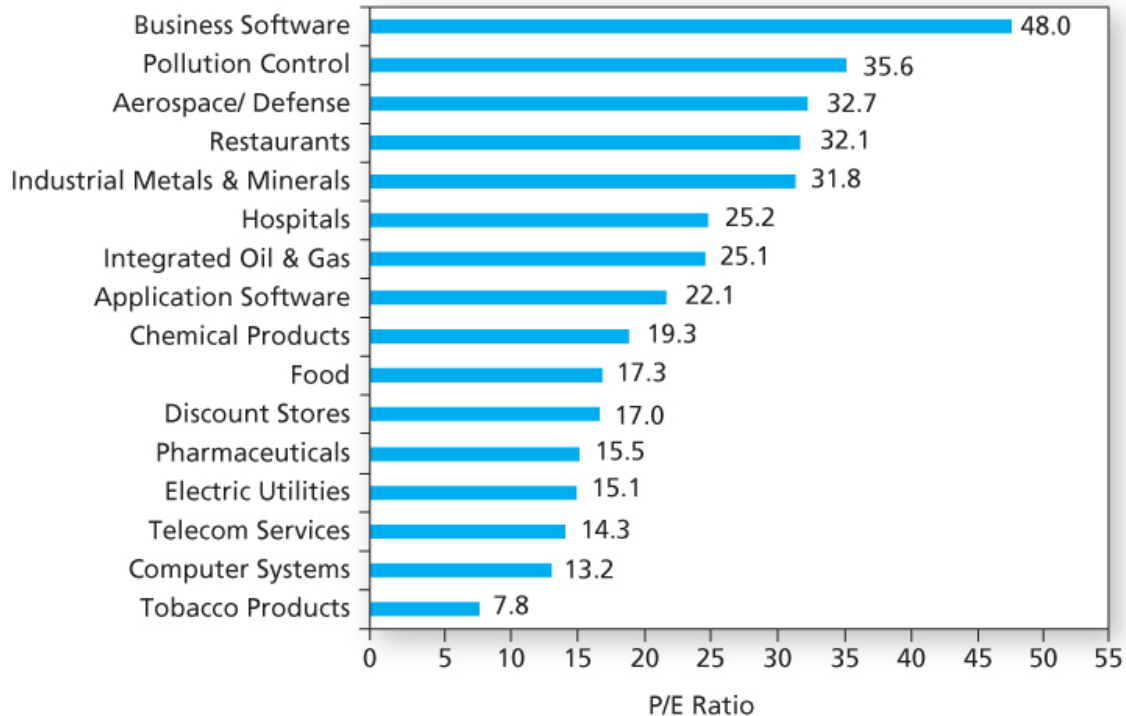


Figure 18.6 P/E ratios for different industries

Source: Data collected from Yahoo! Finance, January 5, 2010.

Other Comparative Value Approaches



- **Price-to-book ratio**
- **Price-to-cash-flow ratio**
- **Price-to-sales ratio**

A complication

- the previous model assumes dividends can be forecast indefinitely
- a forecasting formula can be written

$$D_t = D_{t-1} (1 + g_t)$$

where g_t = the dividend growth rate

The zero growth model

Assumptions

- the future dividends remain constant such that

$$D_1 = D_2 = D_3 = D_4 = \dots = D_N$$

The zero growth model

The zero-growth model

- derivation

$$V = \sum_{t=1}^{\infty} \frac{D_0}{(1+k)^t}$$

$$= D_0 \left[\sum_{t=1}^{\infty} \frac{D_0}{(1+k)^t} \right]$$

The zero growth model

- Using the infinite series property, the model reduces to

- if $g = 0$ $= \sum_{t=1}^{\infty} \frac{1}{(1+k)^t} = \frac{1}{k}$

The zero growth model

- Applying to V

$$V = \frac{D_1}{k}$$

The zero growth model

Example

- If Zinc Co. is expected to pay cash dividends of \$8 per share and the firm has a 10% required rate of return, what is the intrinsic value of the stock?

$$V = \frac{8}{.10}$$
$$= \$80$$

THE ZERO GROWTH MODEL

Example(continued)

If the current market price is \$65, the stock is underpriced.

Recommendation: BUY

Assumptions:

- Dividends are expected to grow at a fixed rate, g such that

$$D_0 (1 + g) = D_1$$

and

$$D_1 (1 + g) = D_2$$

$$\text{or } D_2 = D_0 (1 + g)^2$$

CONSTANT GROWTH MODEL



- In General

$$D_t = D_0 (1 + g)^t$$

CONSTANT GROWTH MODEL

$$V = \sum_{t=1}^{\infty} \frac{D_0 (1+g)^t}{(1+k)^t}$$

D_0 = a fixed amount

$$V = D_0 \left[\sum_{t=1}^{\infty} \frac{(1+g)^t}{(1+k)^t} \right]$$

CONSTANT GROWTH MODEL

- Using the infinite property series,
if $k > g$, then

$$\sum_{t=1}^{\infty} \frac{(1+g)^t}{(1+k)^t} = \frac{1+g}{k-g}$$

Constant growth model

- **Substituting**

$$V = D_0 \left[\frac{1 + g}{k - g} \right]$$

Constant growth model

- since $D_1 = D_0(1 + g)$

$$V = \frac{D_1}{k - g}$$

The multiple-growth model

ASSUMPTION:

- **future dividend growth is not constant**

Model Methodology

- **to find present value of forecast stream of dividends**
- **divide stream into parts**
- **each representing a different value for g**

The multiple-growth model

find PV of all forecast dividends paid up to and including time T denoted V_{T-} .

$$V_{T-} = \sum_{t=1}^T \frac{D_0}{(1+k)^t}$$

The multiple-growth model

Finding PV of all forecast dividends paid after time t

- next period dividend D_{t+1} and all thereafter are expected to grow at rate g

$$V_T = D_{T+1} \left(\frac{1}{k - g} \right)$$

The multiple-growth model

$$\begin{aligned} V_{T+} &= V_T \left[\frac{1}{(1+k)^T} \right] \\ &= \frac{D_{T+1}}{(k-g)(1+k)^T} \end{aligned}$$

The multiple-growth model

- Summing V_{T-} and V_{T+}

$$\begin{aligned}
 V &= V_{T-} + V_{T+} \\
 &= \sum_{t=1}^T \frac{D_T}{(1+k)^t} + \frac{D_{T+1}}{(k-g)(1+k)^T}
 \end{aligned}$$

Price-earnings ratio model

- Many investors prefer the earnings multiplier approach since they feel they are ultimately entitled to receive a firm's earnings

Models based on p/e ratio

PRICE-EARNINGS RATIO MODEL

- EARNINGS MULTIPLIER:

= PRICE - EARNINGS RATIO

= Current Market Price
following 12 month earnings

Price-earnings ratio model

- The Model is derived from the Dividend Discount model:

$$P_0 = \frac{D_1}{k - g}$$

PRICE-EARNINGS RATIO MODEL

- Dividing by the coming year's earnings

$$\frac{P_0}{E_1} = \frac{D_1}{k - g}$$

Price-earnings ratio model

The P/E Ratio is a function of

- the expected payout ratio (D_1 / E_1)
- the required return (k)
- the expected growth rate of dividends (g)

Capitalization of income method

The intrinsic value of a stock

- represented by present value of the income stream

Capitalization of income method

- formula

$$V = \sum_{t=1}^{\infty} \frac{C_t}{(1+k)^t}$$

where

C_t = the expected cash flow

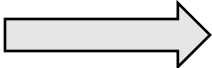
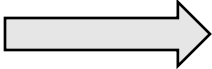
t = time

k = the discount rate

Capitalization of income method

Net present value

- Under or Overpriced?

1. If $NPV > 0$  underpriced
2. If $NPV < 0$  overpriced

Capitalization of income method

Internal rate of return (irr)

- set $NPV = 0$, solve for IRR, or
- the IRR is the discount rate that makes the $NPV = 0$

Application to common stock

- substituting

$$V = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_\infty}{(1+k)^\infty}$$

determines the “true” value of one share

$$= \sum_{t=1}^{\infty} \frac{D_t}{(1+k)^t}$$

A Complication

- the previous model assumes dividends can be forecast indefinitely
- a forecasting formula can be written

$$D_t = D_{t-1} (1 + g_t)$$

where g_t = the dividend growth rate

Sources of earnings growth

What causes growth?

- assume no new capital added
- retained earnings used to pay firm's new investment
- If p_t = the payout ratio in year t
- $1-p_t$ = the retention ratio

Sources of earnings growth

- **New Investments:**

$$I_t = (1 - p_t)E_t$$

Sources of earnings growth

What about the return on equity?

Let r_t = return on equity in time t

**$r_t I_t$ is added to earnings per share in year t+1
and thereafter**

Sources of earnings growth

Assume constant rate of return

$$\begin{aligned} E_{t+1} &= E_t + r_t I_t \\ &= E_t + [1 + r_t(1 - p_t)] \end{aligned}$$

Sources of earnings growth

- IF $E_t = E_{t-1}(1 + g_{et})$

- Then $E_{t+1} = E_t(1 + g_{et+1})$

Sources of earnings growth

- and

$$g_{et+1} = r_t(1 - p_t)$$

sources of earnings growth

- If the growth rate in earnings per share g_{et+1} is constant, then r_t and p_t are constant

Sources of earnings growth



Growth rate depends on

- **the retention ratio**
- **average return on equity**

Sources of earnings growth

- such that

$$V = D_1 \left[\frac{1}{k - r(1 - p)} \right]$$

Value concepts

- **Traditional financial measures have limitations due to accounting distortions**
- **A variety of measures capture the economic performance of the firm**
- **Economic Value Added (EVATM) measures increases in economic value and, hence, shareholder value**
- **Economic Value Added (EVATM) is a long term measure of value creation**

Increasing firm value

A firm must earn returns in excess of its cost of capital

- » Produce more earnings on existing capital structure (**operating**)
- » Increase capital investment (**investing**)
- » Produce same earnings on less capital (**operating**)
- » Reduce the cost of capital (**financing**)

Economic value added

- **Measures real profitably- on a cash basis**
- **Measures the cost of equity- not shown on balance sheets**
- **Cost of equity is its opportunity cost- what the investors could do in their next best alternative**
- **Capital includes long term debt, preferred stock, and common stock**
- **Cost of capital is its weighted average**

FINANCIAL DERIVATIVES

What are Derivatives?

- **A derivative is a financial instrument whose value is derived from the value of another asset, which is known as the underlying.**
- **When the price of the underlying changes, the value of the derivative also changes.**
- **A Derivative is not a product. It is a contract that derives its value from changes in the price of the underlying.**

Example :

The value of a gold futures contract is derived from the value of the underlying asset i.e. Gold.

There are 3 types of traders in the Derivatives Market :

- **HEDGER**

A hedger is someone who faces risk associated with price movement of an asset and who uses derivatives as means of reducing risk.

They provide economic balance to the market.

- **SPECULATOR**

A trader who enters the futures market for pursuit of profits, accepting risk in the endeavor.

They provide liquidity and depth to the market.

- **ARBITRAGEUR**

A person who simultaneously enters into transactions in two or more markets to take advantage of the discrepancies between prices in these markets.

- **Arbitrage involves making profits from relative mispricing.**
- **Arbitrageurs also help to make markets liquid, ensure accurate and uniform pricing, and enhance price stability**
- **They help in bringing about price uniformity and discovery.**

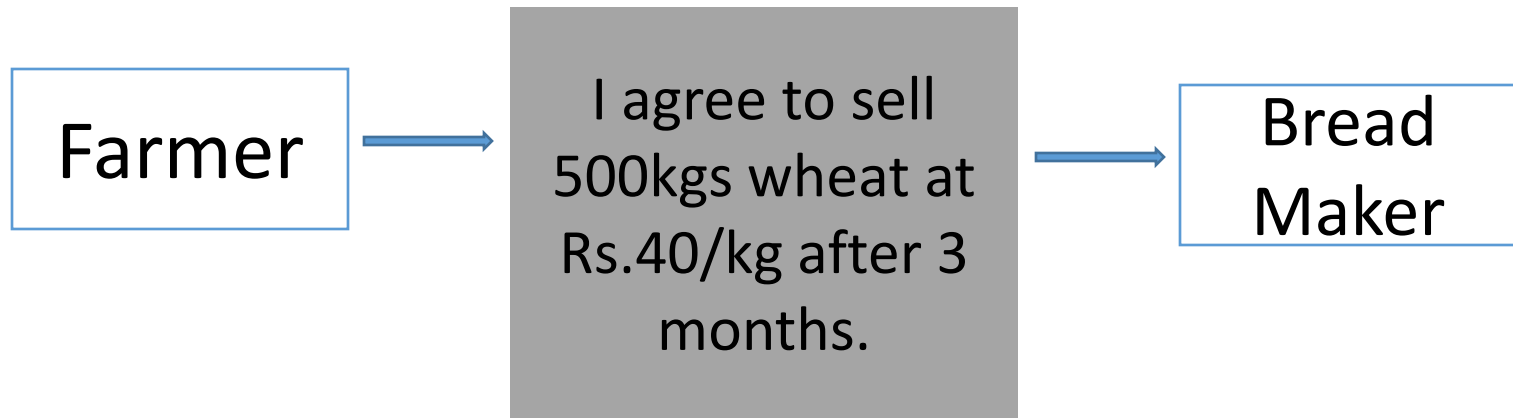
Economic benefits of derivatives

- **Reduces risk**
- **Enhance liquidity of the underlying asset**
- **Lower transaction costs**
- **Enhances liquidity of the underlying asset**
- **Enhances the price discovery process.**
- **Portfolio Management**
- **Provides signals of market movements**
- **Facilitates financial markets integration**

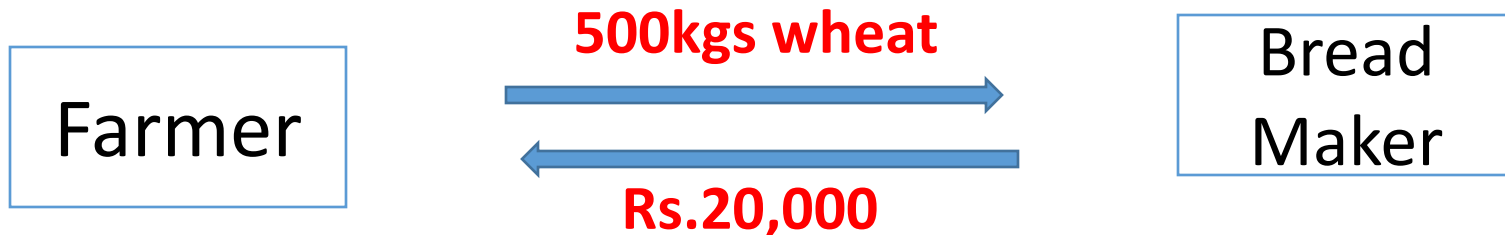
What is a Forward?

- **A forward is a contract in which one party commits to buy and the other party commits to sell a specified quantity of an agreed upon asset for a pre-determined price at a specific date in the future.**
- **It is a customised contract, in the sense that the terms of the contract are agreed upon by the individual parties.**
- **Hence, it is traded OTC.**

Forward Contract Example



3 months Later



Risks in Forward Contracts

- **Credit Risk – Does the other party have the means to pay?**
- **Operational Risk – Will the other party make delivery? Will the other party accept delivery?**
- **Liquidity Risk – In case either party wants to opt out of the contract, how to find another counter party?**

Terminology

- **Long position - Buyer**
- **Short position - seller**
- **Spot price – Price of the asset in the spot market.(market price)**
- **Delivery/forward price – Price of the asset at the delivery date.**

What are Futures?

- **A future is a standardized forward contract.**
- **It is traded on an organised exchange.**
- **Standardizations-**
 - **quantity of underlying**
 - **quality of underlying(not required in financial futures)**
 - **delivery dates and procedure**
 - **price quotes**

Futures Contract Example

A

L \$10
S \$12

Profit \$2

Market Price/Spot Price	
D1	\$10
D2	\$12
D3	\$14

B

S \$10
L \$14

Loss \$4

C

L \$12
S \$14

Profit \$2

Types of Futures Contracts

- **Stock Futures Trading (dealing with shares)**
- **Commodity Futures Trading (dealing with gold futures, crude oil futures)**
- **Index Futures Trading (dealing with stock market indices)**

Closing a Futures Position

- **Most futures contracts are not held till expiry, but closed before that.**
- **If held till expiry, they are generally settled by delivery. (2-3%)**
- **By closing a futures contract before expiry, the net difference is settled between traders, without physical delivery of the underlying.**

Terminology

- **Contract size – The amount of the asset that has to be delivered under one contract. All futures are sold in multiples of lots which is decided by the exchange board.**

Eg. If the lot size of Tata steel is 500 shares, then one futures contract is necessarily 500 shares.

- **Contract cycle – The period for which a contract trades.**

The futures on the NSE have one (near) month, two (next) months, three (far) months expiry cycles.

- **Expiry date – usually last Thursday of every month or previous day if Thursday is public holiday.**

Terminology

- **Strike price** – The agreed price of the deal is called the strike price.
- **Cost of carry** – Difference between strike price and current price.

Margins

- **A margin is an amount of a money that must be deposited with the clearing house by both buyers and sellers in a margin account in order to open a futures contract.**
- **It ensures performance of the terms of the contract.**
- **Its aim is to minimize the risk of default by either counterparty.**

Margins

- **Initial Margin** - Deposit that a trader must make before trading any futures. Usually, 10% of the contract size.
- **Maintenance Margin** - When margin reaches a minimum maintenance level, the trader is required to bring the margin back to its initial level. The maintenance margin is generally about 75% of the initial margin.
- **Variation Margin** - Additional margin required to bring an account up to the required level.
- **Margin call** – If amt in the margin A/C falls below the maintenance level, a margin call is made to fill the gap.

Marking to Market

- **This is the practice of periodically adjusting the margin account by adding or subtracting funds based on changes in market value to reflect the investor's gain or loss.**
- **This leads to changes in margin amounts daily.**
- **This ensures that there are no defaults by the parties.**

What are Options?

- **Contracts that give the holder the option to buy/sell specified quantity of the underlying assets at a particular price on or before a specified time period.**
- **The word “option” means that the holder has the right but not the obligation to buy/sell underlying assets.**

Types of Options

- **Options are of two types – call and put.**
- **Call option give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a particular date by paying a premium.**
- **Puts give the buyer the right, but not obligation to sell a given quantity of the underlying asset at a given price on or before a particular date by paying a premium.**

Types of Options (cont.)

- **The other two types are – European style options and American style options.**
- **European style options can be exercised only on the maturity date of the option, also known as the expiry date.**
- **American style options can be exercised at any time before and on the expiry date.**

Call Option Example

**Premium =
Rs.25/share**

**Amt to buy Call
option = Rs.2500**

CALL OPTION

Right to buy 100
Reliance shares at
a price of Rs.300
per share after 3
months.

Current Price = Rs.250

Strike Price

**Expiry
date**

Suppose after a month,
Market price is Rs.400, then
the option is exercised i.e.
the shares are bought.

Net gain = $40,000 - 30,000 - 2500 = \text{Rs.}7500$

Suppose after a month, market
price is Rs.200, then the option is
not exercised.

Net Loss = Premium amt
= Rs.2500

Put Option Example

**Premium =
Rs.25/share**

**Amt to buy Call
option = Rs.2500**

PUT OPTION

Right to sell 100
Reliance shares at
a price of Rs.300
per share after 3
months.

Current Price = Rs.250

Strike Price

**Expiry
date**

Suppose after a month,
Market price is Rs.200, then
the option is exercised i.e.
the shares are sold.

Net gain = $30,000 - 20,000 - 2500$
= Rs.7500

Suppose after a month, market
price is Rs.300, then the option is
not exercised.

Net Loss = Premium amt
= Rs.2500

Features of Options

- **A fixed maturity date on which they expire. (Expiry date)**
- **The price at which the option is exercised is called the exercise price or strike price.**
- **The person who writes the option and is the seller is referred as the “option writer”, and who holds the option and is the buyer is called “option holder”.**
- **The premium is the price paid for the option by the buyer to the seller.**
- **A clearing house is interposed between the writer and the buyer which guarantees performance of the contract.**

Options Terminology

- **Underlying: Specific security or asset.**
- **Option premium: Price paid.**
- **Strike price: Pre-decided price.**
- **Expiration date: Date on which option expires.**
- **Exercise date: Option is exercised.**
- **Open interest: Total numbers of option contracts that have not yet been expired.**
- **Option holder: One who buys option.**
- **Option writer: One who sells option.**

Options Terminology (cont.)

- **Option class:** All listed options of a type on a particular instrument.
- **Option series:** A series that consists of all the options of a given class with the same expiry date and strike price.
- **Put-call ratio:** The ratio of puts to the calls traded in the market.

Options Terminology (cont.)

- **Moneyness: Concept that refers to the potential profit or loss from the exercise of the option. An option maybe in the money, out of the money, or at the money.**

	Call Option	Put Option
In the money	Spot price > strike price	Spot price < strike price
At the money	Spot price = strike price	Spot price = strike price
Out of the money	Spot price < strike price	Spot price > strike price

What are SWAPS?

- **In a swap, two counter parties agree to enter into a contractual agreement wherein they agree to exchange cash flows at periodic intervals.**
- **Most swaps are traded “Over The Counter”.**
- **Some are also traded on futures exchange market.**

Types of Swaps

There are 2 main types of swaps

- **Plain vanilla fixed for floating swaps
or simply interest rate swaps.**
- **Fixed for fixed currency swaps
or simply currency swaps.**

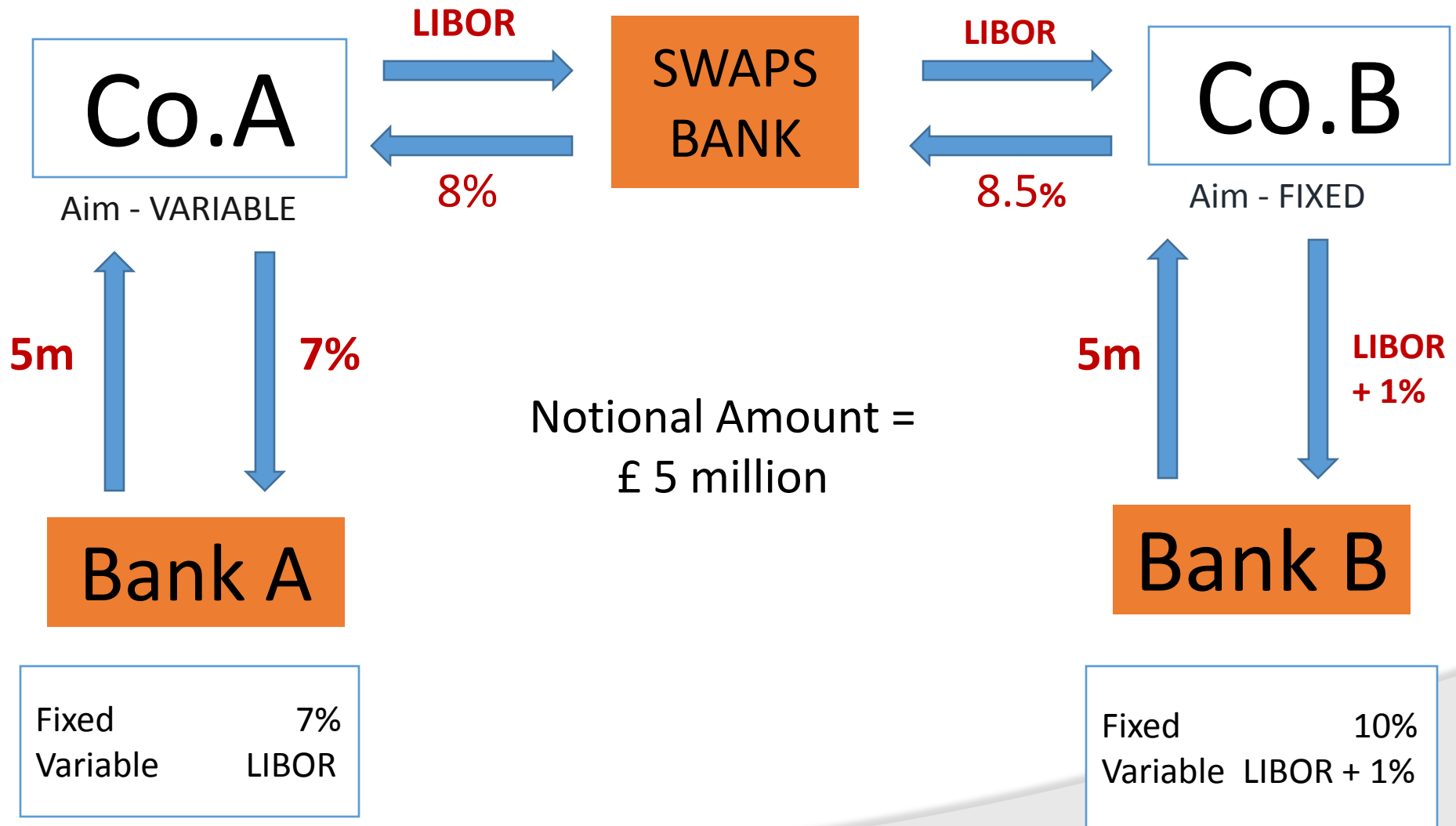
What is an Interest Rate Swap?

- **A company agrees to pay a pre-determined fixed interest rate on a notional principal for a fixed number of years.**
- **In return, it receives interest at a floating rate on the same notional principal for the same period of time.**
- **The principal is not exchanged. Hence, it is called a notional amount.**

Floating Interest Rate

- **LIBOR – London Interbank Offered Rate**
- **It is the average interest rate estimated by leading banks in London.**
- **It is the primary benchmark for short term interest rates around the world.**
- **Similarly, we have MIBOR i.e. Mumbai Interbank Offered Rate.**
- **It is calculated by the NSE as a weighted average of lending rates of a group of banks.**

Interest Rate Swap Example



Using a Swap to Transform a Liability

- **Firm A has transformed a fixed rate liability into a floater.**
 - **A is borrowing at LIBOR – 1%**
 - **A savings of 1%**
- **Firm B has transformed a floating rate liability into a fixed rate liability.**
 - **B is borrowing at 9.5%**
 - **A savings of 0.5%.**
- **Swaps Bank Profits = 8.5%-8% = 0.5%**

What is a Currency Swap?

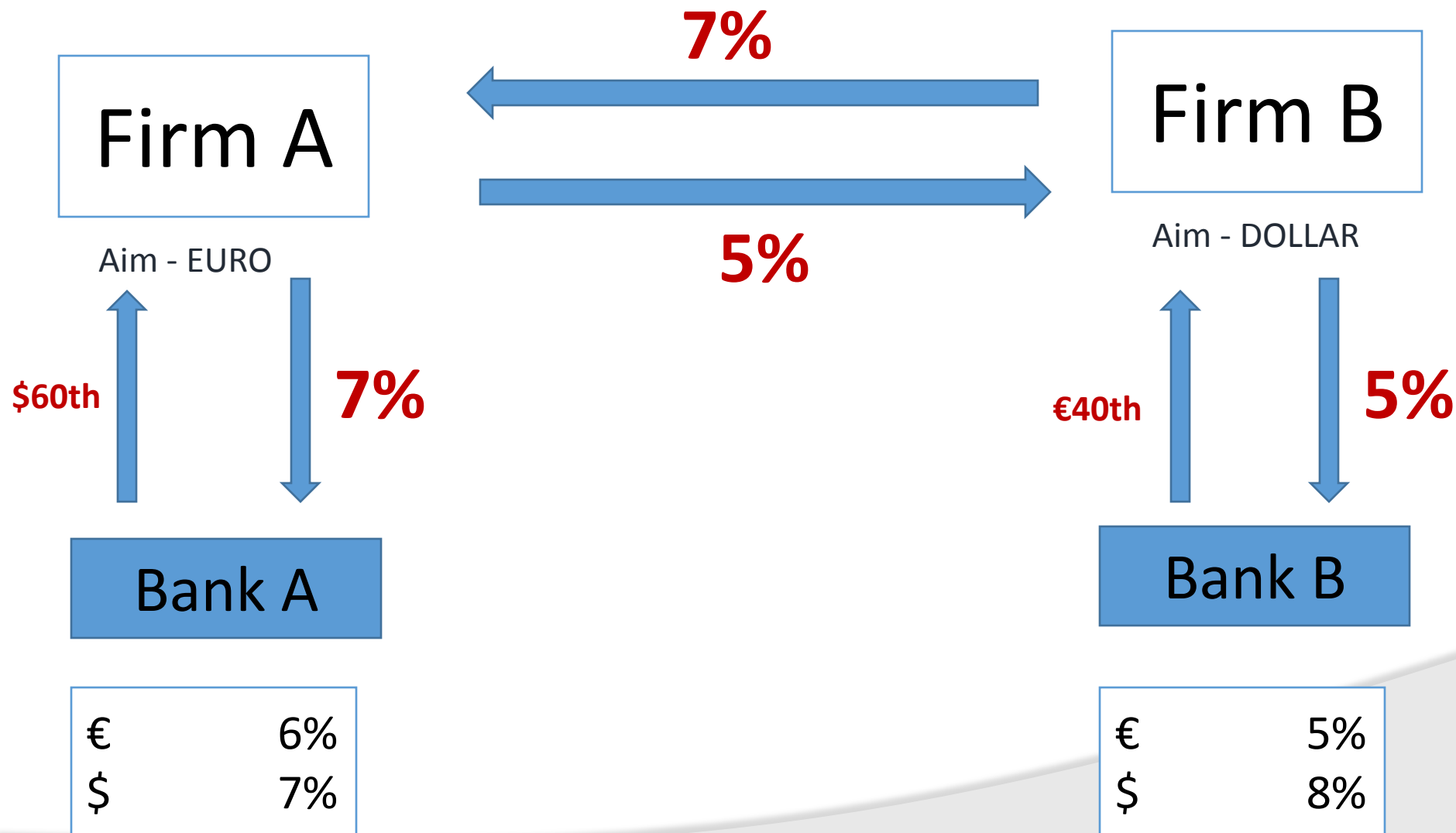
- **It is a swap that includes exchange of principal and interest rates in one currency for the same in another currency**
- **It is considered to be a foreign exchange transaction.**
- **It is not required by law to be shown in the balance sheets.**
- **The principal may be exchanged either at the beginning or at the end of the tenure.**

- **However, if it is exchanged at the end of the life of the swap, the principal value may be very different.**
- **It is generally used to hedge against exchange rate fluctuations.**

Direct Currency Swap Example

- Firm A is an American company and wants to borrow €40,000 for 3 years.
- Firm B is a French company and wants to borrow \$60,000 for 3 years.
- Suppose the current exchange rate is €1 = \$1.50.

Direct Currency Swap Example



Comparative Advantage

- **Firm A has a comparative advantage in borrowing Dollars.**
- **Firm B has a comparative advantage in borrowing Euros.**
- **This comparative advantage helps in reducing borrowing cost and hedging against exchange rate fluctuations.**

UNIT V

MUTUAL FUNDS

Unit- V: Mutual Funds

- **A mutual fund is a common pool of money into which investors place their contributions that are to be invested in different types of securities in accordance with the stated objective.**
- **An equity fund would buy equity assets – ordinary shares, preference shares, warrants etc.**
- **A bond fund would buy debt instruments such as debenture bonds, or government securities/money market securities.**

Myths about Mutual Funds



- 1. Mutual Funds invest only in shares.**
- 2. Mutual Funds are prone to very high risks/actively traded.**
- 3. Mutual Funds are very new in the financial market.**
- 4. Mutual Funds are not reliable and people rarely invest in them.**
- 5. The good thing about Mutual Funds is that you don't have to pay attention to them.**

Facts about Mutual Funds



- 1. Equity Instruments like shares are only a part of the securities held by mutual funds. Mutual funds also invest in debt securities which are relatively much safer.**
- 2. Mutual Funds are there in India since 1964. Mutual Funds market has evolved in U.S.A and is there for the last 60 years.**
- 3. Mutual Funds are the best solution for people who want to manage risks and get good returns.**

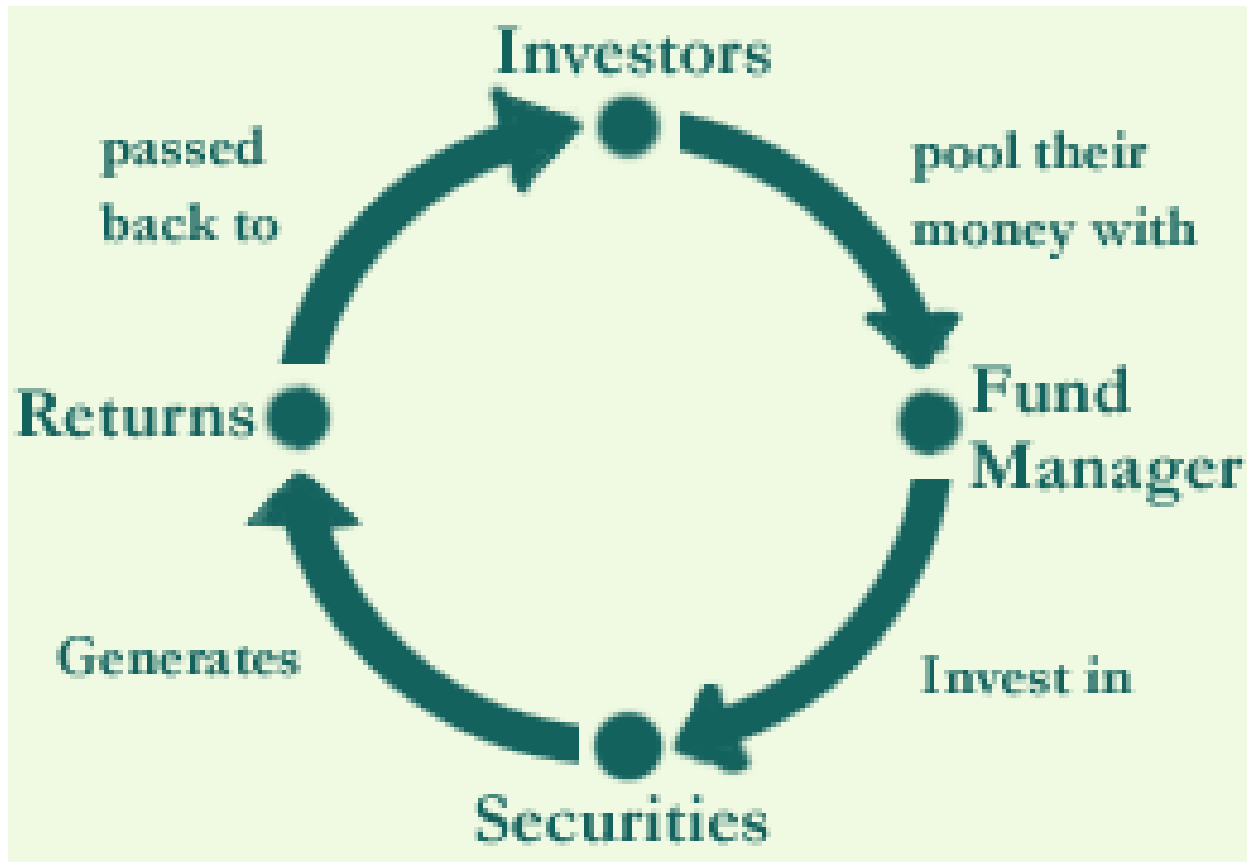
Facts about Mutual Funds



- 4. US is very much a part of the market and is not immune to its vagaries. The crisis has risen due to mismanagement of the fund.**

Mutual Funds

A Cyclic Process



History of mf's

- **History of MF's can be discussed in two parts :**
 - 1) Emergence through public players; and**
 - 2) Emergence through private players**

History of Mutual Funds

Phase I – 1964 – 87: In 1963, UTI was set up by Parliament under UTI act and given a monopoly. The first equity fund was launched in 1986.

Phase II – 1987 – 93: Non-UTI, Public Sector mutual funds.

Like

MUTUAL FUNDS



**Mutual Fund,
bank Mutual Fund,
Mutual Fund,
ian Bank Mutual Fund,
Mutual Fund and
IB Mutual Fund.**

History of Mutual Funds

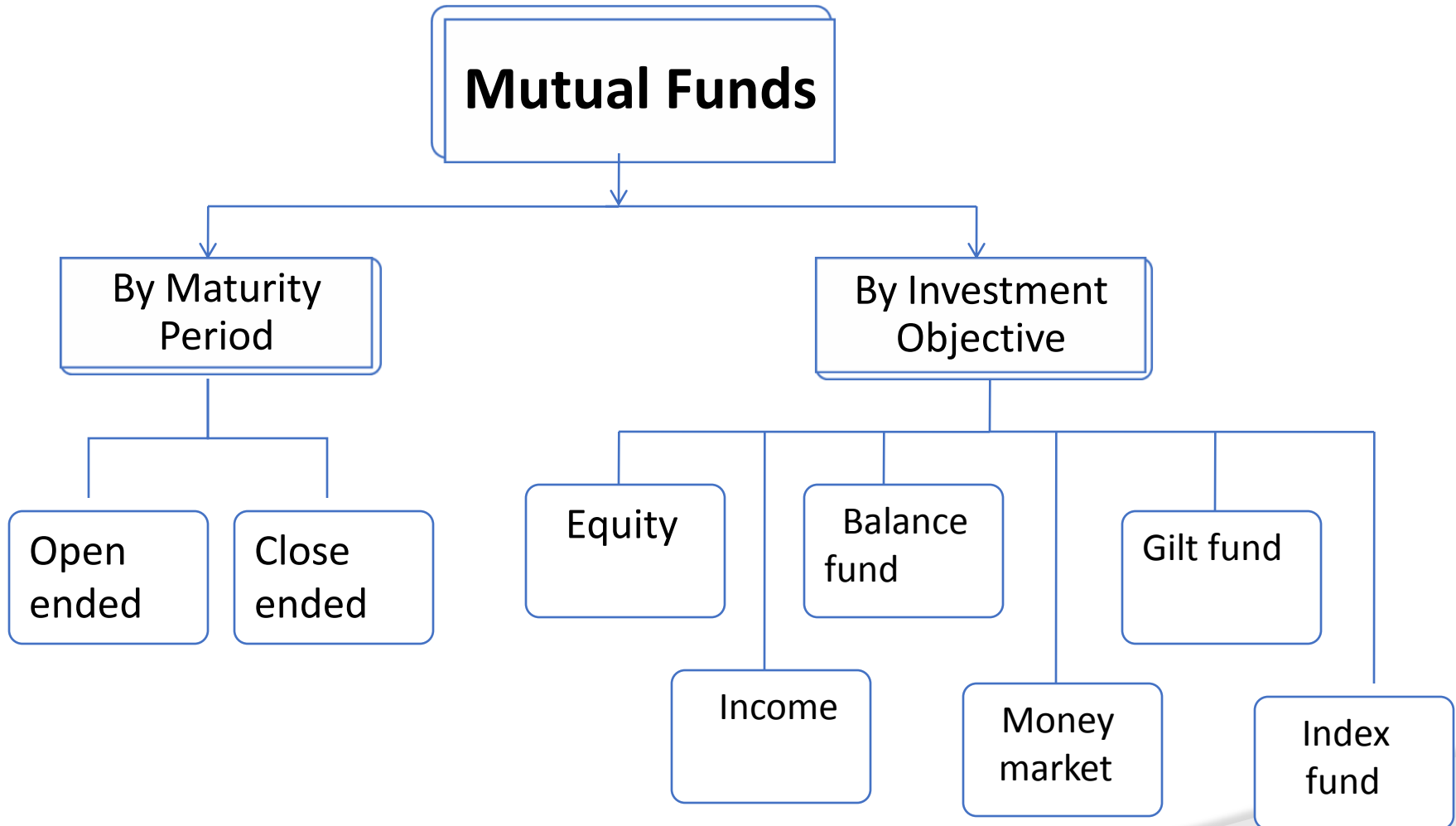


**Phase III – 1993 – 96: Introducing private sector funds.
As well as open-end funds.**

**Phase IV – 1996: Investor friendly regulatory measures
Action taken by SEBI to protect the investor, and To
enhance investor's returns through tax benefits.**

TYPES OF MUTUAL FUNDS

Types of Mutual funds



By Structure:

- 1. Open-ended Funds**
- 2. Closed-ended Funds**
- 3. Interval Funds**

By Investment Objective:



- 1. Growth Funds**
- 2. Income Funds**
- 3. Balanced Funds**
- 4. Money Market Funds**
- 5. Load Funds**
- 6. No-Load Funds**

Tax Saving Schemes

Some times the investors investing their money in the mutual funds to get some tax benefits.

Advantages of Mutual Funds

- **Portfolio diversification:** It enables him to hold a diversified investment portfolio even with a small amount of investment like Rs. 2000/-.
- **Professional management:** The investment management skills, along with the needed research into available investment options, ensure a much better return as compared to what an investor can manage on his own.

Advantages of Mutual Funds

- **Liquidity:** Investors may be unable to sell shares directly, easily and quickly. When they invest in mutual funds, they can cash their investment any time by selling the units to the fund if it is open-ended and get the intrinsic value. Investors can sell the units in the market if it is closed-ended fund.
- **Convenience and Flexibility:** Investors can easily transfer their holdings from one scheme to other, get updated market information and so on. Funds also offer additional benefits like regular investment and regular withdrawal options.

Advantages of Mutual Funds

- **Transparency:** Fund gives regular information to its investors on the value of the investments in addition to disclosure of portfolio held by their scheme, the proportion invested in each class of assets and the fund manager's investment strategy and outlook

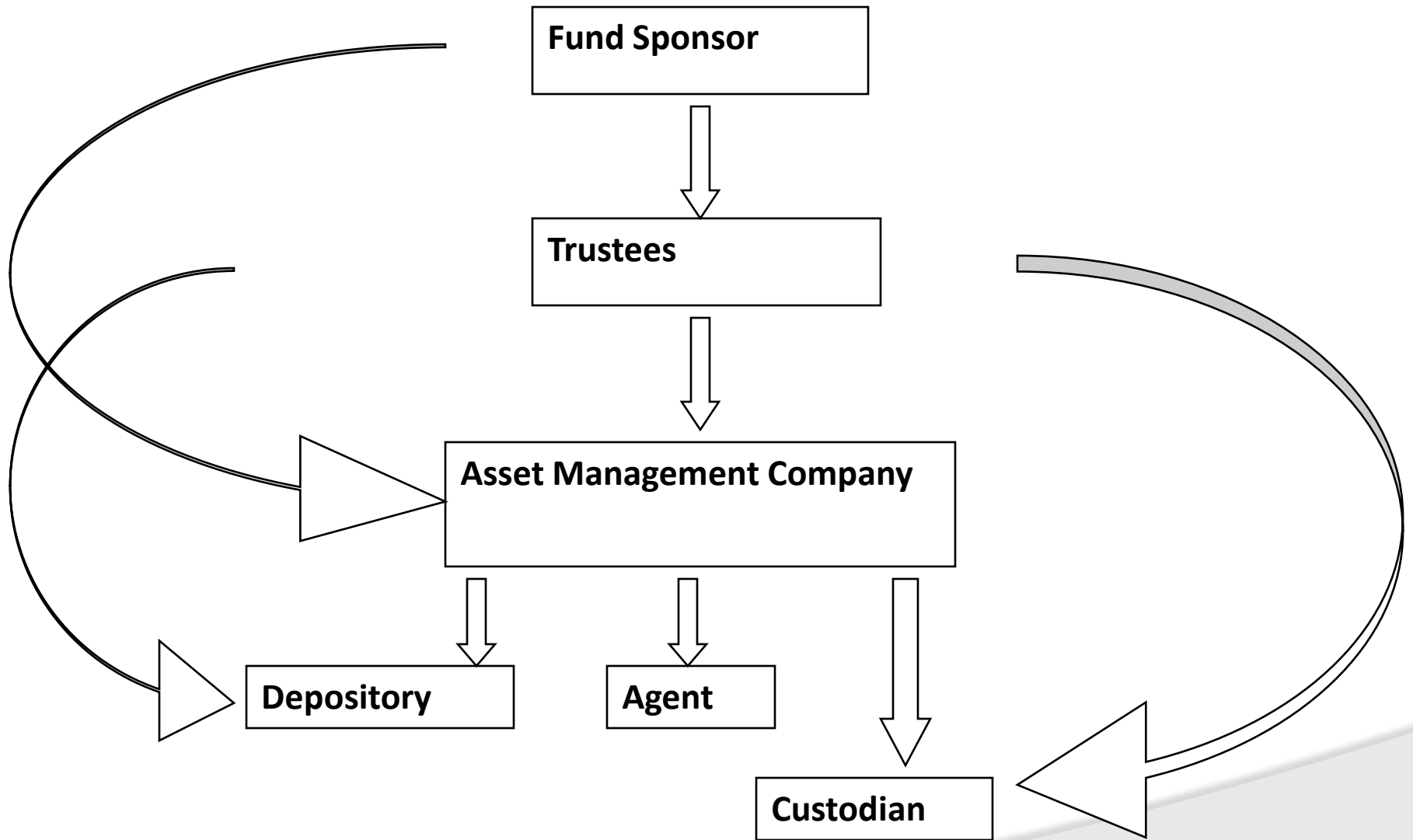
Disadvantages of Mutual Funds

- **No control over costs:** The investor pays investment management fees as long as he remains with the fund, even while the value of his investments are declining. He also pays for funds distribution charges which he would not incur in direct investments.
- **No tailor-made portfolios:** The very high net-worth individuals or large corporate investors may find this to be a constraint as they will not be able to build their own portfolio of shares, bonds and other securities.

Disadvantages of Mutual Funds

- **Managing a portfolio of funds:** Availability of a large number of funds can actually mean too much choice for the investor. So, he may again need advice on how to select a fund to achieve his objectives.
- **Delay in redemption:** It takes 3-6 days for redemption of the units and the money to flow back into the investor's account.

Fund Structure



Fund Sponsor

The Fund Sponsor

- Any person or corporate body that establishes the Fund and registers it with SEBI.
- Form a Trust and appoint a Board of Trustees.
- Appoints Custodian and Asset Management Company either directly or through Trust, in accordance with SEBI regulations.

SEBI regulations also define that a sponsor must contribute at least 40% to the net worth of the asset management company.

Trustees

- Created through a document called the Trust Deed that is executed by the Fund Sponsor and registered with SEBI.
- The Trust-the mutual fund may be managed by a Board of Trustees- a body of individuals or a Trust Company- a corporate body.
- Protector of unit holders interests.
- *2/3 of the trustees shall be independent persons and shall not be associated with the sponsors.*

Trustees

Rights of Trustees:

- **Approve each of the schemes floated by the AMC.**
- **The right to request any necessary information from the AMC.**
- **May take corrective action if they believe that the conduct of the fund's business is not in accordance with SEBI Regulations.**
- **Have the right to dismiss the AMC,**
- **Ensure that, any shortfall in net worth of the AMC is made up.**

Obligations of the Trustees:

- Enter into an investment management agreement with the AMC.
- Ensure that the fund's transactions are in accordance with the Trust Deed.
- Furnish to SEBI on a half-yearly basis, a report on the fund's activities
- Ensure that no change in the fundamental attributes of any scheme or the trust or any other change which would affect the interest of unit holders is happens without informing the unit holders.
- Review the investor complaints received and the redressal of the same by the AMC.

Asset Management Company



- **Acts as an invest manager of the Trust under the Board Supervision and direction of the Trustees.**
- **Has to be approved and registered with SEBI.**
- **Will float and manage the different investment schemes in the name of Trust and in accordance with SEBI regulations.**
- **Acts in interest of the unit-holders and reports to the trustees.**
- **At least 50% of directors on the board are independent of the sponsor or the trustees.**

Obligation of Asset Management Company:

- ✓ **Float investment schemes only after receiving prior approval from the Trustees and SEBI.**
- ✓ **Send quarterly reports to Trustees.**
- ✓ **Make the required disclosures to the investors in areas such as calculation of NAV and repurchase price.**
- ✓ **Must maintain a net worth of at least Rs. 10 crores at all times.**
- ✓ **Will not purchase or sell securities through any broker, which is average of 5% or more of the aggregate purchases and sale of securities made by the mutual fund in all its schemes.**

Custodian

- **Has the responsibility of physical handling and safe keeping of the securities.**
- **Should be independent of the sponsors and registered with SEBI.**

Depositories

- Indian capital markets are moving away from physical certificates for securities to 'dematerialized' form with a Depository.
- Will hold the dematerialized security holdings of the Mutual Fund.

Mutual Funds are primary vehicles for large collective investments, working on the principle of pooling funds.

A substantial portion of the investments happen at the retail level.

Agents and distributors are a vital link between the mutual funds and investors.

Agents

- Is a broker between the fund and the investor and acts on behalf of the principal.**
- He is not exclusive to the fund and also sells other financial services. This in a way helps him to act as a financial advisor.**

Distribution Channels

Banks and NBFCs

- Several banks, particularly private and foreign banks are involved in a fund distribution by providing similar services like that of distribution companies.
- They work on commission basis.

Direct Marketing

- Mutual funds sell their own products through their sales officers and employees of the AMC.
- This channel is normally used to mobilize funds from high net worth individuals and institutional investors.

Agent Commissions

- **No rules prescribed for governing the maximum or minimum commissions payable by a fund to its agents.**
- **As per SEBI regulations, 1996 all initial expenses including brokerage charges paid to agents cannot exceed 6% of resources raised under the scheme.**
- **Excess distribution charges have to be borne by the AMC.**
- **A no-load fund is authorized to charge the schemes with the commissions paid to agents as part of the regular management and marketing expenses allowed by SEBI.**

Three Performance Measures

The Sharpe measure (SP) (Sharpe, 1966) is of immediate concern. Given two of the portfolios depicted in Figure 7.4, portfolios B and D, their relative risk-return performance can be compared using the equations:

$$SP_D = \frac{\bar{R}_D - R_f}{\sigma_D} \text{ and } SP_B = \frac{\bar{R}_B - R_f}{\sigma_B}$$

where

SP_D, SP_B = Sharpe performance measures;

\bar{R}_D, \bar{R}_B = the average return of each portfolio;

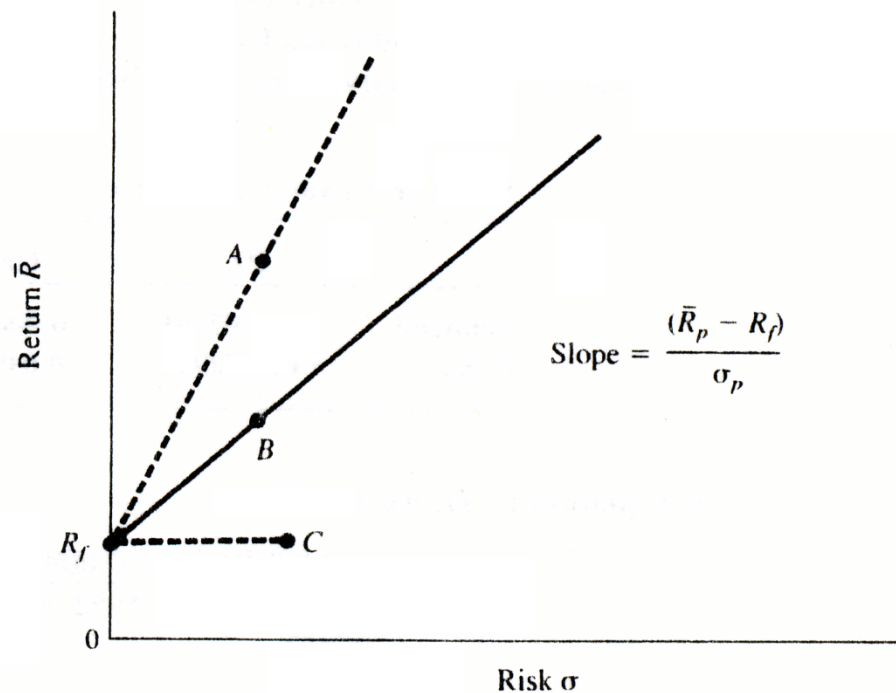
R_f = risk - free rate; and

σ_D, σ_B = the respective standard deviation on risk of each portfolio.

Sharpe measure (SP)

If a riskless rate exists, then all investors would prefer A to B because combinations of A and the riskless asset give higher returns for the same level of risk than combinations of the riskless asset and B.

FIGURE 7-5 Combinations of Portfolio and the Risk-Free Investment



Sample Problem

Table 7.4	<i>Smyth Fund</i>	<i>Jones Fund</i>
Average return R (%)	18	16
Standard deviation (%)	20	15
Risk-free rate $= R_f$ (%) = 9.5		

Using the Sharpe performance measure, the risk-return measurements for these two firms are:

$$SP_{\text{Smyth}} = \frac{0.18 - 0.095}{0.20} = 0.425$$

$$SP_{\text{Jones}} = \frac{0.16 - 0.095}{0.15} = 0.433$$

Jones fund has better performance based on Sharpe measure.

Treynor measure (TP)

- Treynor measure (TP), developed by Treynor in 1965, examines differential return when beta is the risk measure.

The Treynor measure can be expressed by the following:

$$TP = \frac{\bar{R}_j - R_f}{\beta_j}$$

where:

\bar{R}_j = average return of j th portfolio;

R_f = risk – free rate; and

β_j = beta coefficient for j th portfolio.

- The Treynor performance measure uses the beta coefficient (systematic risk) instead of total risk for the portfolio as a risk measure.

Portfolio Revision

- **The investor should have competence and skill in the revision of the portfolio.**
- **The portfolio management process needs frequent changes in the composition of stocks and bonds.**
- **Mechanical methods are adopted to earn better profit through proper timing.**
- **Such type of mechanical methods are Formula Plans and Swaps.**

Passive Management

- **Passive management refers to the investor's attempt to construct a portfolio that resembles the overall market returns.**
- **The simplest form of passive management is holding the index fund that is designed to replicate a good and well defined index of the common stock such as BSE-Sensex or NSE-Nifty.**

Active Management

- **Active Management is holding securities based on the forecast about the future.**
- **The portfolio managers who pursue active strategy with respect to market components are called ‘market timers’.**
- **The managers may indulge in ‘group rotations’.**
- **Group rotation means changing the investment in different industries stocks depending on the assessed expectations regarding their future performance.**

The Formula Plans

- **The formula plans provide the basic rules and regulations for the purchase and sale of securities.**
- **The aggressive portfolio consists more of common stocks which yield high return with high risk.**
- **The conservative portfolio consists of more bonds that have fixed rate of returns.**

Assumptions of the Formula Plan

- **Certain percentage of the investor's fund is allocated to fixed income securities and common stocks.**
- **The stocks are bought and sold whenever there is a significant change in the price.**
- **The investor should strictly follow the formula plan once he chooses it.**
- **The investors should select good stocks that move along with the market.**

Advantages of the Formula Plan

- **Basic rules and regulations for the purchase and sale of securities are provided.**
- **The rules and regulations are rigid and help to overcome human emotion.**
- **The investor can earn higher profits by adopting the plans.**
- **It controls the buying and selling of securities by the investor.**
- **It is useful for taking decisions on the timing of investments.**

Disadvantages of the Formula Plan

- The formula plan does not help the selection of the security.
- It is strict and not flexible with the inherent problem of adjustment.
- Should be applied for long periods, otherwise the transaction cost may be high.
- Investor needs forecasting.

Rupee Cost Averaging

- **Stocks with good fundamentals and long term growth prospects should be selected.**
- **The investor should make a regular commitment of buying shares at regular intervals.**
- **Reduces the average cost per share and improves the possibility of gain over a long period.**

Constant Rupee Plan

- **A fixed amount of money is invested in selected stocks and bonds.**
- **When the price of the stocks increases, the investor sells sufficient amount of stocks to return to the original amount of the investment in stocks.**
- **The investor must choose action points or revaluation points.**
- **The action points are the times at which the investor has to readjust the values of the stocks in the portfolio.**

Constant Ratio Plan

- **Constant ratio between the aggressive and conservative portfolios is maintained.**
- **The ratio is fixed by the investor.**
- **The investor's attitude towards risk and return plays a major role in fixing the ratio.**

Variable Ratio Plan

- **At varying levels of market price, the proportions of the stocks and bonds change.**
- **Whenever the price of the stock increases, the stocks are sold and new ratio is adopted by increasing the proportion of defensive or conservative portfolio.**
- **To adopt this plan, the investor is required to estimate a long term trend in the price of the stocks.**