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This document has 3 parts –

1. **Tips for Objective Questions**
2. **Big Questions –** These are the numerical questions that are to be solved step by step in the exam. I have gone through previous years question papers and have collected all such questions that, taken together, cover the whole syllabus. I have found this to be of great use because it saved me from solving the workbook. I haven't found any question out of this set in past two examinations (the ones conducted after I prepared these notes.)
3. **Theory Questions –** These are the theoretical question from past years question papers. These questions are important ones. Many of these are often repeated. However, ICFAI has a tendency to ask one or two entirely new questions in each question paper that are not answered anywhere in the book or workbook or past question papers.

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**Tips for Objective Questions**

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Cost of Equity or Discount Rate or Required Rate =  $r_f + \beta(r_m - r_f)$

Growth Rate or Expected Rate  $g = (1-dpr) * \text{Net Profit margin} * \text{sales/book value}$

Growth Rate or Expected Rate  $g = RoE * r = RoE * \text{retention ratio} = RoE * (1 - dpr)$

FCFE =  $\text{Net Income} - (\text{CAPEX} - \text{Depreciation})(1-b) - (\text{Change in Working Capital})(1-b)$

$b = \text{debt/asset ratio}$

Residual Income =  $\text{Net Income} - \text{Equity Charge} == \text{NI} - \text{req rate} * \text{book value}$

Residual income =  $(ROE - r) * \text{Book value}$

$RoE = \text{NI/Book Value}$

$RoE = \text{NProfit/NetWorth}$

Du Pont -

$ROE = \text{NP/S} * \text{S/Tot Ass} * \text{Tot Ass/Ave Eq}$

$ROE = \text{Net Profit margin} * \text{Total assets Turnover} * \text{Financial leverage}$

Fin Leverage =  $\text{Total Ass/Average Eq}$

Book Value  $n+1 = \text{Book Value } n + \text{Retained Earnings}$

$P/\text{Earning} = \text{DPR} * (1+g) / (e-g)$

$P/\text{Sales} = \text{NPM} * \text{DPR} * (1+g) / (e-g) = 0.10 * 0.25 * 1.05 / (.12 - .05) = 0.375$

$P/\text{Book Value} = \text{RoE} * \text{DPR} * (1+g) / (e-g)$

$P_0 = D (1+g) / (k - g)$

$\text{Cov}_{AB} \% = (100) \text{Beta}_A * \text{Beta}_B = 100 * (1.53) (0.81) = 123.93$

Beta of a security A =  $\text{Cov Am} / \text{sigma m sq}$

10% increase in Market return resulted in 16% increase in Arihant Ltd. stock. Thus the beta for the Arihant Ltd. stock is 1.6.

Systematic risk is  $\beta^2 \sigma_m = (1.6^2)(257.81) = 660\%^2$

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Exponential moving average(current) = ( (Price(current) - Exponential moving average(prev) ) x Multiplier) + Exponential moving average(prev)

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Spin Offs -

(a) There will be a possibility for considerable selling pressure from institutions and index funds immediately after the spin-off

(b) The new company formed by the spin off **need to** incur expenses for issuing new shares

(c) Servicing the shareholders leads to duplication of the activities in parent and the spin-off company

(d) A spin off is often perceived as a method for getting rid of a sub-par asset by the parent

(e) As shares are distributed primarily to existing shareholders, spin-off lack liquidity.

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**EMH -**

As per the weak form of efficiency theory, stock prices fully reflect all **historical** price information. Run test is used to test the weak form of EMH.

Semi-strong form of efficiency implies that market prices reflect all **publicly available information** concerning past trading as well as fundamental aspects of the firm. Hence stock prices are not predictable using the publicly available information.

Super strong form of efficiency stock prices fully reflects **all relevant information including insider information**.

Relationship between the historical P/E ratios and risk-adjusted market performance is evidence against the semi-strong form of market efficiency.

EMH signifies how quickly and accurately does relevant information show its effect on the asset prices.

EMH says that successive absolute short run price changes are independent.

Weak form of efficient market hypothesis is also known as random walk model.

Serial correlation and run test are for testing the **weak form** of efficient market hypothesis.

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Fundamental valuation efficiency is said to exist if the price of the asset is equal to its intrinsic value.

Information arbitrage efficiency is said to exist if the participants do not have any scope to reap abnormal profits using information, which is of common knowledge.

Full insurance efficiency is said to exist if participants can adopt hedging strategies as effective tools against possible risks in future.

Operational efficiency is said to exist if the operating costs are minimum possible to the participants, but still provide a fair return to the intermediaries for their services.

Allocational efficiency is said to exist, if the market channelizes resources into projects where the marginal efficiency of capital adjusted for risk differences is the highest.

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**H Model -**

According to H model there are two phases of growth – abnormal growth rate and long run normal growth rate and it is assumed that in **2H** years the growth decreases from abnormal growth rate to normal growth rate.

According to the model, if the current growth rate is greater than the normal long run growth rate, the growth rate eventually decreases.

The intrinsic value of a share according to the model is equal to the value based on the normal growth rate plus premium due to abnormal growth rate.

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The SML essentially graphs the results from the capital asset pricing model (CAPM) formula.

The x-axis represents the risk (beta), and the y-axis represents the expected return. The market risk premium is determined from the slope of the SML.

SML typically represents the average or normal trade-off between risk and return for a group of securities, where risk is measured typically, in terms of the securities betas.

The amount by which a security's return differed from the normal return for its level of risk is simply the vertical distance of the security's plot on the graph from the SML.

Ex-post SMLs are used to evaluate the performance of portfolio managers and to test the validity of CAPM. The slope of the characteristic line (not SML) is the beta for the particular security involved.

Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. A beta of greater than 1 indicates that the security's price will be more volatile than the market. For example, if a stock's beta is 1.2, it's theoretically 20% more volatile than the market. Beta is the slope of the regression line (characteristic line). Beta measures non-diversifiable risk also known as systematic risk. Beta indicates the manner in which a security's return changes systematically with changes in the market's return. Beta greater than one is referred to as an aggressive security.

HOEC Ltd. has the following characteristic line variables as per the past behavior of prices.  $\alpha = 2.5\%$  and  $\beta = 1.6$ . If the market index subsequently rises by 12% in one month and HOEC Ltd. stock price increases by 20%, what is the abnormal change in HOEC Ltd. stock price?

Expected change in stock price =  $2.5 + 1.6(12) = 21.7$ ;

Abnormal change =  $20 - 21.7 = -1.7\%$

The current earning per share of Amrita Fertilizer Ltd. is Rs.5. The analyst of this company forecasts the two probable situations in the future. Firstly, if the market is good, company will retain 60% of its profit and invests the amount at 17.5%. Secondly, if market is bad, the company will pay the whole earnings as dividends. What will be decrease in amount of share price in later situation, assuming cost of equity to be 12%?

Growth =  $.60 * 17.5$  so Share value =  $\text{eps} * \text{dpr} * \text{g}/\text{k} - \text{g} = 5 * .4 * .105 / (.12 - .105) = 147.33$   
Share value in case of DPS = 1 =  $\text{eps}/\text{k} = 5/.12 = 41.67$   
Decrease =  $105.66$

### Moving Averages

Technical analysts observe moving averages more for crossovers than for the changes in direction

When the moving average rises above the price line, a reversal in bullish trend is signaled

The price line that falls below a rising moving average only indicates a secondary reaction and not a trend reversal

A moving average represents a smoothed trend and **therefore acts** as a support/resistance line

If the moving average is flat or has already begun to change direction, a crossover by the price line is a fairly reliable indicator of trend reversal.

### Economic Value Added -

- . To evaluate performance of management
- . proxy for measuring stock's performance
- . can be applied to capital budgeting

## 2 Ways to compute EVA -

### 1. Residual Income Method (Spread Method)

It involves computation of difference between two returns of same risk level :  $(\text{NOPLAT}/\text{Total Capital} - \text{WACC}) * \text{Total Capital}$

This method is also called spread method.

EVA number should be +ive. -ive value is not good for investor to choose the security.

### 2. Refined Earnings Method

Under this method  $\text{EVA} = (\text{Sales} - \text{Operating expenses}) - (\text{WACC}) (\text{Net assets})$ . The method focuses on the factors that create growth in a company.

### Market Value Added -

Measure of firm's external performance.

Future Growth value to Market value ratio is used for performing sanity test.

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A stop order to sell becomes a market order if the market price goes below the spot order price. In a stop limit order to buy, the investor can specify the maximum price that he is ready to pay for the stock.

In case of sale, the stop loss order clearly states that the sale should not be executed at any price below the stop loss target.

A stop-loss order is an order to buy or sell when the price crosses a specified level.

A stop-order to buy, enter above the prevailing market price, becomes a market order when the contract is either traded or bid at or above the price.

If for stop loss buy order, the trigger is Rs.75.00, the limit price is Rs.78.00 and the last traded price is Rs.72, then this order is released into the system once the market price reaches or exceeds Rs.75.00.

A stop loss is an order to buy (or sell) a security once the price of the security climbed above (or dropped below) a specified stop price. When the specified stop price is reached, the stop order is entered as a market order (no limit) or a limit order (fixed or pre-determined price).

With a stop order, the trader does not have to actively monitor how a stock is performing. However because the order is triggered automatically when the stop price is reached, the stop price could be activated by a short-term fluctuation in a security's price. Once the stop price is reached, the stop order becomes a market order or a limit order.

In a fast-moving volatile market, the price at which the trade is executed may be much different from the stop price in the case of a market order. Alternatively in the case of a limit order the trade may or may not get executed at all. This happens when there are no buyers or sellers available at the limit price.

A **stop loss limit order** is an order to buy a security at no more (or sell at no less) than a specified limit price. This gives the trader some control over the price at which the trade is executed, but may prevent the order from being executed.

A **stop loss buy limit order** can only be executed by the exchange at the limit price or lower. For example, if a trader is short and wants to protect his short position but doesn't want to

pay more than Rs.100 for the stock, the investor can place a stop loss buy limit order to buy the stock at any price up to Rs.100. By entering a limit order rather than a market order, the investor will not be caught buying the stock at Rs.110 if the price rises sharply.

Alternatively a **stop loss sell limit order** can only be executed at the limit price or higher.

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The lead indicator approach attempts to forecast the general economic conditions by identifying economic indicators that turn ahead of the change in the general level of economic activity. A lead indicator provides signals about the direction of economic activity. It does not convey message about the magnitude of change. It does not convey message about the duration of change. Different lead indicators may provide divergent signals.

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Treatment of research and development expenditure, gratuity liability and depreciation provision affects the profit figure of a company and valuation of inventories also affects the profit and loss account however revaluation of financial investment for treasury operation only affect the balance sheet

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### Technical Analysis -

The basic assumptions underlying technical analysis are as follows:

- Market value is determined solely by the interaction of supply and demand.
- Supply and demand are governed by numerous factors, both rational and irrational.
- Ignoring minor fluctuations in the market, stock prices tend to move in trends which persist for an appreciable length of time.
- Changes in trend are caused by shifts in supply and demand.
- Shifts in supply and demand, no matter why they occur, can be detected sooner or later in charts of market value.
- Some chart patterns tend to repeat themselves.

**"Breakaway"** gaps typically end consolidation patterns such as rectangles, triangles or bases. They often occur on very high volume, signaling that supply at a fixed level has been exhausted and that purchasers anxious to acquire the stock must pay up to do so.

**Exhaustion gaps** represent gaps occurring before a trend ends, or gaps that precede the last leg of a bullish or bearish trend. An "exhaustion" gap occurs at the end of a move. It is the last fevered push of the bulls. The alert swing trader can often recognize an "exhaustion" gap by the fact that on the following day there is little or no further upward movement. Moreover, volume often peaks on the very day of the exhaustion gap or the day after. An exhaustion gap is treated as a sign of consolidation.

**Runaway gaps** occur when prices are on a rapid uptrend or downtrend. They generally occur almost halfway through a trend. It is a type of gap on a price chart that occurs during strong bull or bear movements characterized by an abrupt change in price and appearing over a range of prices. They are best described as gaps caused by a sudden increase/decrease in interest for a stock.

A series of runaway gaps indicate that an exhaustion gap is round the corner.

Runaway gaps are also called **measuring gaps**.

Islands refer to the formation of an isolated price pattern, usually within a narrow range, at the end of a price trend, the island is separated by an **exhaustion gap** and a **breakaway gap**.

The **following principles** are to be applied while using support and resistance lines for trend analysis:

i. Support and resistance lines are only approximations of the levels, prices may be expected to 'obey'. They should, therefore, be drawn using judgement, and clues from the past price behavior.

ii. Penetration of a support and resistance line, also confirmed by an underlying price pattern, is a fairly sure indication of a strong ensuing move in the same direction. New highs are reached after a resistance line is penetrated and new low follow penetration of a support line.

iii. Prices are said to remain in a 'congestion zone' as long as they fluctuate in narrow ranges within a support and resistance level. The direction of breakout from a congestion zone cannot be predicted in advance.

iv. The higher the volume accompanying the confirmation of a support or resistance level, the more its significance.

v. The speed and extent of the previous move determines the significance of a support or resistance level. Prices penetrate support (resistance) level generally after slowing down from a previous low (high) and hovering around a level for sometime.

vi. Support and resistance levels repeat their effectiveness time and again, even if separated by many years.

A distribution accompanied by increased volume is a bearish factor. Termination of a bear market is signaled by a selling climax.

**Selling Climax :** Following a protracted period of selling or buying, a point wherein market trends are retarded or discontinued. At a selling climax, the market is characterized by a trend reversal whereby the market begins to buy stocks and prices rise. For a buying climax, the opposite occurs, and the market begins to sell, resulting in lower prices. The climax is merely the highest point of selling or buying and can be followed by many trend reversals.

**Distribution:** When trading volume is higher than that of the previous day without any price appreciation.

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**Big Questions**

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1. Mr. Aman, an analyst is considering two stocks, Infosys and Satyam for investing. Expected returns on these stocks depend on the growth rate of the GDP. The conditional returns of the stocks and the market index are given below:

| Economic Scenario<br>(GDP growth rate) | Probability | Expected returns (%) |        |              |
|--|-------------|----------------------|--------|--------------|
|  |             | Infosys              | Satyam | Market Index |
| Less than 4.0%                         | 0.05        | -20.00               | 20.00  | -10.00       |
| 4.0-6.5%                               | 0.30        | -4.00                | 12.00  | -2.00        |
| 6.5-8.5%                               | 0.45        | 30.00                | 8.00   | 16.00        |
| More than 8.5%                         | 0.20        | 44.00                | -4.00  | 24.00        |

The expected risk-free return is 6.0 percent. Assume that the CAPM holds good in the market.

You are required to:

- Estimate standard deviation of returns and betas of the stocks. (8marks)
- Determine the excess return per unit of risk for both the stocks. Which stock should the analyst select? (4marks)

**1.a. INFOSYS**

| Probability (p) | Infosys              |                |                     |                               | Market Index         |                |                     |                                |   |
|-----------------|----------------------|----------------|---------------------|-------------------------------|----------------------|----------------|---------------------|--------------------------------|---|
|                 | Exp Return ( $r_i$ ) | $p \times r_i$ | $(r_i - \bar{r}_i)$ | $\sum (r_i - \bar{r}_i)^2 Xp$ | Exp Return ( $r_m$ ) | $p \times r_m$ | $(r_m - \bar{r}_m)$ | $(r_m - \bar{r}_m)^2 \times p$ | $(r_i - \bar{r}_i)(r_m - \bar{r}_m) \times p$ |
| 1               | 2                    | 3              | 4                   | 5                             | 6                    | 7              | 8                   | 9                              | 10  |
| 0.05            | -20.00               | -1.00          | -40.10              | 80.40                         | -10.00               | -0.50          | -20.90              | 21.84                          | 41.90   |
| 0.30            | -4.00                | -1.20          | -24.10              | 174.24                        | -2.00                | -0.60          | -12.90              | 49.92                          | 93.27   |
| 0.45            | 30.00                | 13.50          | 9.90                | 44.10                         | 16.00                | 7.20           | 5.10                | 11.70                          | 22.72   |
| 0.20            | 44.00                | 8.80           | 23.90               | 114.24                        | 24.00                | 4.80           | 13.10               | 34.32                          | 62.62   |

Mean ( $\bar{r}_a$ ) =  $\sum pXr_i = 20.10$   
10.90

Mean ( $\bar{r}_m$ ) =  $\sum pXr_m =$

Variance =  $\sum (r_i - \bar{r}_i)^2 Xp = 412.98$

Variance =  $\sum (r_m - \bar{r}_m)^2 Xp = 117.79$

Standard Deviation =  $\sqrt{412.98} = 20.32$   
10.85

Standard Deviation =  $\sqrt{117.79} =$

Covariance =  $\sum (r_i - \bar{r}_i)(r_m - \bar{r}_m)Xp = 220.51$

Beta =  $\frac{COV_{i,m}}{\sigma_m^2} = 1.8721$

**SATYAM**

| Probability (p) | Satyam               |                |                     |                                | Market Index         |                |                     |                                |   |
|-----------------|----------------------|----------------|---------------------|--------------------------------|----------------------|----------------|---------------------|--------------------------------|---|
|                 | Exp Return ( $r_s$ ) | $p \times r_s$ | $(r_s - \bar{r}_s)$ | $(r_s - \bar{r}_s)^2 \times p$ | Exp Return ( $r_m$ ) | $p \times r_m$ | $(r_m - \bar{r}_m)$ | $(r_m - \bar{r}_m)^2 \times p$ | $(r_s - \bar{r}_s)(r_m - \bar{r}_m) \times p$ |
| 1               | 2                    | 3              | 4                   | 5                              | 6                    | 7              | 8                   | 9                              | 10  |
| 0.05            | 20.00                | 1.00           | 12.60               | 7.94                           | -10.00               | 0.50           | -20.90              | 21.84                          | -13.17  |
| 0.30            | 12.00                | 3.60           | 4.60                | 6.35                           | -2.00                | 0.60           | -12.90              | 49.92                          | -17.80  |
| 0.45            | 8.00                 | 3.60           | 0.60                | 0.16                           | 16.00                | 7.20           | 5.10                | 11.70                          | 1.38  |
| 0.20            | -4.00                | -0.80          | -11.40              | 25.99                          | 24.00                | 4.80           | 13.10               | 34.32                          | -29.87  |

$$\text{Mean } (\bar{r}_s) = \sum pXr_s = 7.40$$

$$\text{Variance} = \sum (r_s - \bar{r}_s)^2 Xp = 40.44$$

$$\text{Standard Deviation} = \sqrt{40.44} = 6.36$$

$$\text{Covariance} = \sum (r_s - \bar{r}_s)(r_m - \bar{r}_m) Xp = -59.46$$

$$\text{Beta} = \frac{\text{COV}_{s,m}}{\sigma_m^2} = -0.5048$$

b. **INFOSYS**

$$\text{Required return} = r_f + \beta(r_m - r_f) = 6.00 + [1.8721(10.90 - 6.00)] = 15.17$$

$$\text{Excess return} = (\text{Expected return} - \text{required return}) =$$

$$\frac{\text{Excess return}}{\text{Standard deviation}} = \frac{4.93}{20.32} = 0.2426$$



**SATYAM**

$$\text{Required return} = r_f + \beta(r_m - r_f) = 6.00 + [-0.5048(10.90 - 6.00)] = 3.53$$

$$\text{Excess return} = (\text{Expected return} - \text{required return}) = 7.40 - 3.53 = 3.87$$

$$\frac{\text{Excess return}}{\text{Standard deviation}} = \frac{3.87}{6.36} = 0.6085$$

As the Excess return to Standard deviation is higher for the stock of Satyam, Mr. Aman should choose Satyam's stock.

2. Escorts Multimedia Ltd., is considering the acquisition of Prudential Advertising Ltd., in a stock-for-stock transaction in which Prudential Advertising Ltd., would receive Rs.84.30 for each share of its common stock. The Escorts Multimedia Ltd., does not expect any change in its P/E multiple after the merger and chooses to value the Prudential Advertising Ltd., conservatively by assuming no earnings growth due to synergy.

You are provided with the following information:

| Particulars                               | Escorts Multimedia Ltd. | Prudential Advertising Ltd. |
|---|-------------------------|-----------------------------|
| Earnings available for common stock (Rs.) | 2,81,500                | 62,500                      |
| Outstanding shares (Nos.)                 | 1,12,000                | 18,750                      |
| Market price per share (Rs.)              | 56.25                   | 62.50                       |

You are **required** to calculate

- a.
  - i. Post-merger share price.
  - ii. Post-merger equity ownership distribution.
  - iii. Purchase price premium. (7marks)
- b. Comment on the decision taken by the Escorts Multimedia Inc. (2marks)

**Answer**



i. Post merger share price = Post merger EPS × Premerger P/E.

$$\begin{aligned} \text{Exchange Ratio} &= \frac{\text{Price per share offered for Target Company}}{\text{Market Price per share of the acquiring company}} \\ &= \frac{\text{Rs.84.30}}{\text{Rs.56.25}} = 1.5 \end{aligned}$$

Acquiring company issues 1.5 shares of stock for each share of target company stock.

- New shares issued by Acquiring Company = Shares of Target Company × Exchange Ratio  
= 18750 × 1.5 = 28,125.

- Total shares outstanding of the combined companies = Acquiring company shares + New shares of Target Company  
112000 + 28125 = 140125.

- Post merger EPS of the combined companies  
$$\begin{aligned} &= \frac{\text{Earnings available for common stock of acquiring company} + \text{Earning available of target company}}{\text{Total shares outstanding of combined companies after acquisition}} \\ &= \frac{\text{Rs.281500} + \text{Rs.62500}}{140125} \\ &= \frac{\text{Rs.344000}}{140125} = \text{Rs.2.45.} \end{aligned}$$

- Premerger EPS of Escorts Multimedia = 
$$\begin{aligned} &= \frac{\text{Earnings of company}}{\text{No. of shares of acquiring company}} \\ &= \frac{\text{Rs.281500}}{112000} = \text{Rs.2.51.} \end{aligned}$$

$$\begin{aligned} \bullet \text{ Premerger P/E} &= \frac{\text{Premerger Price Per Share}}{\text{Premerger Earnings Per Share}} \\ &= \frac{\text{Rs.56.25}}{\text{Rs.2.51}} = 22.4 \\ \text{Post merger share price} &= \text{Post merger EPS} \times \text{Premerger P/E} \\ &= \text{Rs.2.46} \times 22.4 = \text{Rs.54.88} \end{aligned}$$

ii. Post merger equity ownership distribution

$$\begin{aligned} \text{Ownership of Prudential Advertising List} &= \frac{\text{New shares received}}{\text{Total No. of shares outstanding of the combined companies}} \\ &= \frac{28125}{140125} = 20.1\% \\ \text{Ownership of acquiring company} &= (100 - 20.1\%) = 79.9\% \end{aligned}$$

$$\begin{aligned} \text{iii. Purchase price premium} &= 1 - \frac{\text{Offer price for target company stock}}{\text{Target company market price per share}} \\ &= 1 - \frac{\text{Rs.84.30}}{\text{Rs.62.50}} = 0.35 \text{ or } 35\% \end{aligned}$$

- b. The acquisition results in Rs.1.37 (Rs.56.25 – Rs.54.88) reduction in the share price of the acquiring company due to Rs.0.06 (Rs.2.51 – Rs.2.45) decline in EPS of the combined companies. (Recall that acquiring company assumed no gains in earnings of the combined companies due to synergy) whether the acquisition is a poor decision depends upon what happens to the earnings of the combined companies over time. If the combined companies earnings grow more rapidly than the acquiring company's earnings would have in the absence of the acquisition, the acquisition may contribute to the market value of the acquiring company.

4.

Santa Limited, with fast food restaurants throughout the country, reported a net profit of Rs.108.5 crore on sales of Rs.742.5 crore. The sales/book value ratio of the firm is approximately 1.2, and the dividend payout ratio is 20%. The book value per share is Rs.19. The firm is expected to maintain high growth for ten years as per the dynamic growth model, during which it will maintain the current dividend payout ratio. After the high growth period, the growth rate is expected to drop to 6%, and the dividend payout ratio is expected to be 65%. The beta of the stock is 1.05.

The 1 year treasury bill rate is 7% and premium on market portfolio is 5.5%.

You are required to Estimate the price/sales ratio for Santa based upon its characteristics.

| Particulars                       | Next ten years | After ten years |
|-----------------------------------|----------------|-----------------|
| Payout Ratio                      | 20.00%         | 65.00%          |
| Expected Growth Rate <sup>1</sup> | 14.03%         | 6.00%           |
| Cost of Equity <sup>2</sup>       | 12.775%        | 12.775%         |
| Profit Margin <sup>3</sup>        | 14.61%         | 14.61%          |

Working Notes:

1. ROE = Net Profit Margin x Sales/Book value

Expected Growth rate = (1 – Payout ratio) x Net Profit Margin x Sales/Book Value

$$= (1-0.20) \times \frac{108.5}{742.5} \times 1.2 = 0.1403$$

2. Cost of Equity =  $R_F + \beta(R_M - R_F) = 7 + 1.05(5.5) = 12.78\%$

3. Profit Margin =  $\frac{\text{Profit}}{\text{Sales}} = \frac{108.5}{742.5} = 14.61\%$

Book value of the Santa's shares = Rs. 19

Total book value of the shares =  $\frac{\text{Sales}}{\text{Sales/Book Value}} = \frac{742.5}{1.2} = \text{Rs.}618.75 \text{ crore}$

So, the number of shares outstanding =  $\frac{618.75}{19} = 32.5657895$

Earnings per share =  $\frac{108.5}{32.5657895} = \text{Rs.}3.33$

Share Price using Dividend Discount Model:

| Year | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| EPS  | 3.797  | 4.33   | 4.937  | 5.63   | 6.42   | 7.32   | 8.35   | 9.52   | 10.86  | 12.38  |
| DPS  | 0.7594 | 0.866  | 0.9874 | 1.126  | 1.284  | 1.464  | 1.67   | 1.904  | 2.172  | 2.476  |
| PV   | 0.6733 | 0.6809 | 0.6883 | 0.6960 | 0.7037 | 0.7115 | 0.7196 | 0.7275 | 0.7358 | 0.7438 |

$$\text{Terminal Value} = \frac{12.38 \times 1.06 \times 0.65}{(0.1278 - 0.06)} = 125.81$$

$$\text{Present Value of Terminal Value} = \frac{125.81}{(1.1278)^{10}} = 37.79$$

So, the share price of Santa's would be

$$0.6733 + 0.6809 + 0.6883 + 0.6960 + 0.7037 + 0.7115 + 0.7196 + 0.7275 + 0.7358 + 0.7438 + 37.79 = \text{Rs.}44.87$$

$$\text{So, Price/Sales Ratio} = \frac{\text{Share price} \times \text{Number of Shares Outstanding}}{\text{Total Sales}}$$

$$= \frac{44.87 \times 32.5657895}{742.5} = 1.97$$

1. The Expected Earnings of Mehta Investment Trust (MIT) for the next four years are Rs.200 crores, Rs.350 crores, Rs.500 crores and Rs.625 crores respectively. There are 10 crores outstanding units for MIT with a face value of Rs. 100 each. The expected dividend payments in the next three years are Rs.10, Rs.20 and Rs.25 respectively. MIT will also pay Rs.212.50 per unit at the end of the 4<sup>th</sup> year when the investment trust terminates. The required return on equity for the investment trust is 10%.

You are **required** to:

- a. Find the current value per unit for Mehta Investment Trust (MIT) as per the dividend discount model.
- b. Calculate per-unit book value and residual income for MIT for the next four years and use those results to find the per unit value using the residual income model.
- c. Calculate return on equity and use it as an input in the residual income model and calculate the MIT's per unit value.

(2 + 3 + 3 = 8 marks)

1. a. Value of per unit for Mehta Investment Trust (MIT) as per the dividend discount model:

$$= \frac{10}{1.1} + \frac{20}{(1.1)^2} + \frac{25}{(1.1)^3} + \frac{212.50}{(1.1)^4}$$

$$= 189.544$$

- b. The book value and residual incomes for the next four years are:

| Year                                       | 1      | 2      | 3      | 4        |
|--|--------|--------|--------|----------|
| Beginning book value                       | 100.00 | 110.00 | 125.00 | 150.00   |
| Retained earnings (Net income – Dividends) | 10.00  | 15.00  | 25.00  | (150.00) |
| Ending book value                          | 110.00 | 125.00 | 150.00 | 0.00     |
| Net income                                 | 20.00  | 35.00  | 50.00  | 62.50    |
| Less equity charge (r × book value)        | 10.00  | 11.00  | 12.50  | 15.00    |
| Residual income                            | 10.00  | 24.00  | 37.50  | 47.50    |
| Present value @ 10%                        | 9.09   | 19.83  | 28.17  | 32.44    |

Therefore Value per unit as per residual income  
 = 100 + 9.09 + 19.83 + 28.17 + 32.44 = 189.53.

- c.

| Year                                     | 1      | 2      | 3      | 4      |
|--|--------|--------|--------|--------|
| Net income                               | 20.00  | 35.00  | 50.00  | 62.50  |
| Beginning book value                     | 100.00 | 110.00 | 125.00 | 150.00 |
| Return on equity                         | 20.00% | 31.82% | 40.00% | 41.67% |
| ROE – r                                  | 10.00% | 21.82% | 30.00% | 31.67% |
| Residual income = (ROE – r) × Book value | 10.00  | 24.00  | 37.50  | 47.50  |
| Present value @ 10%                      | 9.09   | 19.83  | 28.17  | 32.44  |

Therefore Value per unit as per residual income  
 = 100 + 9.09 + 19.83 + 28.17 + 32.44 = 189.53.

5. The price of the Reliance Capital Ltd. as on 1<sup>st</sup> August 2005 is 451.55. Given below are the closing prices of Reliance Capital Ltd. during the month of July 2003 and 2005.

| DD/MM/YY  | Close | DD/MM/YY  | Close  |
|-----------|-------|-----------|--------|
| 1-Jul-03  | 70.20 | 1-Jul-05  | 376.35 |
| 2-Jul-03  | 72.80 | 4-Jul-05  | 378.80 |
| 3-Jul-03  | 74.25 | 5-Jul-05  | 379.40 |
| 4-Jul-03  | 74.30 | 6-Jul-05  | 408.50 |
| 7-Jul-03  | 72.30 | 7-Jul-05  | 394.30 |
| 8-Jul-03  | 71.55 | 8-Jul-05  | 404.15 |
| 9-Jul-03  | 69.70 | 11-Jul-05 | 402.20 |
| 10-Jul-03 | 70.05 | 12-Jul-05 | 406.40 |
| 11-Jul-03 | 70.05 | 13-Jul-05 | 410.70 |
| 14-Jul-03 | 71.85 | 14-Jul-05 | 399.50 |
| 15-Jul-03 | 69.70 | 15-Jul-05 | 399.30 |
| 16-Jul-03 | 71.80 | 18-Jul-05 | 404.45 |
| 17-Jul-03 | 73.00 | 19-Jul-05 | 410.40 |
| 18-Jul-03 | 71.60 | 20-Jul-05 | 408.80 |
| 21-Jul-03 | 68.80 | 21-Jul-05 | 397.30 |
| 22-Jul-03 | 67.90 | 22-Jul-05 | 403.65 |
| 23-Jul-03 | 68.10 | 25-Jul-05 | 398.70 |
| 24-Jul-03 | 70.55 | 26-Jul-05 | 394.70 |
| 25-Jul-03 | 71.95 | 27-Jul-05 | 396.55 |
| 28-Jul-03 | 72.00 | 29-Jul-05 | 418.25 |
| 29-Jul-03 | 72.25 | —         | —      |

You are **required** to test the Weak Form of efficient market hypothesis by checking whether stock prices are independent or not.

Answer:

5.

| Price change (in X) | Price change (in Y) | X <sup>2</sup> | Y <sup>2</sup> | XY      |
|---------------------|---------------------|----------------|----------------|---------|
| 2.60                | 2.45                | 6.7600         | 6.0025         | 6.37    |
| 1.45                | 0.60                | 2.1025         | 0.3600         | 0.87    |
| 0.05                | 29.10               | 0.0025         | 846.8100       | 1.455   |
| -2.00               | -14.20              | 4.0000         | 201.6400       | 28.4    |
| -0.75               | 9.85                | 0.5625         | 97.0225        | -7.3875 |
| -1.85               | -1.95               | 3.4225         | 3.8025         | 3.6075  |
| 0.35                | 4.20                | 0.1225         | 17.6400        | 1.47    |
| 0.00                | 4.30                | 0.0000         | 18.4900        | 0       |
| 1.80                | -11.20              | 3.2400         | 125.4400       | -20.16  |
| -2.15               | -0.20               | 4.6225         | 0.0400         | 0.43    |
| 2.10                | 5.15                | 4.4100         | 26.5225        | 10.815  |
| 1.20                | 5.95                | 1.4400         | 35.4025        | 7.14    |
| -1.40               | -1.60               | 1.9600         | 2.5600         | 2.24    |
| -2.80               | -11.50              | 7.8400         | 132.2500       | 32.2    |
| -0.90               | 6.35                | 0.8100         | 40.3225        | -5.715  |
| 0.20                | -4.95               | 0.0400         | 24.5025        | -0.99   |
| 2.45                | -4.00               | 6.0025         | 16.0000        | -9.8    |

|             |              |              |                |              |
|-------------|--------------|--------------|----------------|--------------|
| 1.40        | 1.85         | 1.9600       | 3.4225         | 2.59         |
| 0.05        | 21.70        | 0.0025       | 470.8900       | 1.085        |
| 0.25        | 33.30        | 0.0625       | 1108.8900      | 8.325        |
| <b>2.05</b> | <b>75.20</b> | <b>49.36</b> | <b>3178.01</b> | <b>62.94</b> |

$$\sum X = 2.05, \bar{X} = \frac{2.05}{20} = 0.1025, (\bar{X})^2 = 0.0105$$

$$\sum Y = 75.20, \bar{Y} = \frac{75.20}{20} = 3.76, (\bar{Y})^2 = 14.1376$$

From regression analysis,

$$b = \frac{\sum XY - n\bar{X}\bar{Y}}{\sum X^2 - n\bar{X}^2} = \frac{62.94 - 20(0.1025)(3.76)}{49.36 - 20(0.0105)}$$

$$b = \frac{55.232}{49.15} = 1.1237$$

$$a = \bar{Y} - b\bar{X}$$

$$a = 3.76 - (1.1237)(0.1025)$$

$$a = 3.6448$$

Coefficient of correlation,

$$r^2 = \frac{a\sum Y + b\sum XY - nY^2}{\sum Y^2 - n\bar{Y}^2}$$

$$r^2 = \frac{3.6448 \times 75.20 + 1.1237 \times 62.94 - 20 \times 14.1376}{3178.01 - 20 \times 14.1376}$$

$$r^2 = \frac{62.063}{2895.258} = 0.0214$$

$$\therefore r = 0.1464$$

Since the correlation between the prices in two different periods is small, we conclude that the prices move in random fashion.

1. The data given below relates to stock prices of Satyam Computers Ltd. for the first thirteen trading sessions in the month of November, 2003 and November, 2005 respectively.

| Days | Closing price (2003) | Closing price (2005) |
|------|----------------------|----------------------|
| 1    | 372.45               | 612.55               |
| 2    | 373.90               | 630.30               |
| 3    | 390.65               | 636.40               |
| 4    | 387.65               | 642.45               |
| 5    | 393.10               | 636.25               |
| 6    | 391.65               | 630.55               |
| 7    | 399.80               | 651.10               |
| 8    | 405.15               | 648.55               |
| 9    | 403.20               | 652.05               |
| 10   | 404.30               | 654.15               |
| 11   | 412.35               | 646.25               |
| 12   | 411.35               | 630.15               |
| 13   | 430.75               | 625.75               |

You are **required** to check whether these stock prices are independent or not using auto-correlation test.

(9 marks)

1. a.

| Days         | Price changes  |                | X <sup>2</sup>  | Y <sup>2</sup>   | XY              |
|--------------|----------------|----------------|-----------------|------------------|-----------------|
|              | X              | Y              |                 |                  |                 |
| 1            | 1.4500         | 17.7500        | 2.1025          | 315.0625         | 25.7375         |
| 2            | 16.7500        | 6.1000         | 280.5625        | 37.2100          | 102.1750        |
| 3            | -3.0000        | 6.0500         | 9.0000          | 36.6025          | -18.1500        |
| 4            | 5.4500         | -6.2000        | 29.7025         | 38.4400          | -33.7900        |
| 5            | -1.4500        | -5.7000        | 2.1025          | 32.4900          | 8.2650          |
| 6            | 8.1500         | 20.5500        | 66.4225         | 422.3025         | 167.4825        |
| 7            | 5.3500         | -2.5500        | 28.6225         | 6.5025           | -13.6425        |
| 8            | -1.9500        | 3.5000         | 3.8025          | 12.2500          | -6.8250         |
| 9            | 1.1000         | 2.1000         | 1.2100          | 4.4100           | 2.3100          |
| 10           | 8.0500         | -7.9000        | 64.8025         | 62.4100          | -63.5950        |
| 11           | -1.0000        | -16.1000       | 1.0000          | 259.2100         | 16.1000         |
| 12           | 19.4000        | -4.4000        | 376.3600        | 19.3600          | -85.3600        |
| <b>Total</b> | <b>58.3000</b> | <b>13.2000</b> | <b>865.6900</b> | <b>1246.2500</b> | <b>100.7075</b> |
| <b>Mean</b>  | <b>4.8583</b>  | <b>1.1000</b>  |                 |                  |                 |

$$\bar{X} = 4.8583 \quad \bar{Y} = 1.1$$

$$\Sigma X^2 = 865.6900 \quad \Sigma X = 58.3000$$

$$\Sigma Y^2 = 1246.2500 \quad \Sigma Y = 13.2000$$

$$\Sigma XY = 100.7075$$

$$r^2 = \frac{a\Sigma Y + b\Sigma XY - n(\bar{Y})^2}{\Sigma Y^2 - n(\bar{Y})^2}$$

$$a = \bar{Y} - b\bar{X}$$

$$b = \frac{\Sigma XY - n\bar{X}\bar{Y}}{\Sigma X^2 - n(\bar{X})^2}$$

$$\begin{aligned}
 &= \frac{100.7075 - 12(4.8583)(1.1)}{865.69 - 12(4.8583)^2} \\
 &= 0.0628 \\
 a &= 1.1 - (0.0628)(4.8583) = 0.7945 \\
 r^2 &= \frac{0.7945 \times 13.2 + (0.0628)(100.7075) - 12 \times (1.1)^2}{1246.25 - 12 \times (1.1)^2} \\
 &= \frac{2.29}{1231.73} \\
 &= 0.0019
 \end{aligned}$$

Hence, there is a small degree of correlation between the returns of two periods and therefore we can conclude that index moved in a random manner.

2. Mr. Biswajit Poddar an analyst is evaluating Halol Industries Ltd (HIL). The company has maintained high growth rates in the face of strong competition in the last few years; it has done so while maintaining high returns on capital. The fundamentals suggest that growth will continue to be high and given the size of the market and potential growth (as well as the strong brand name identification), growth seems sustainable for a longer period.

Mr. Biswajit Poddar has the following information for HIL:

**Current Earnings / Dividends**

Earnings per share in 2005-06 is Rs.26.00.

**Mr. Biswajit has assumed the following inputs:**

**Inputs for the High Growth Period**

- Length of the high growth period is 5 years.
- Expected growth rate in earnings is 22.00% (Based upon analyst projections).
- Beta during high growth period is 1.20.
- Risk free rate is 5.5%.
- Market rate of return is 12%.
- Dividend Payout Ratio is 25% (based on existing payout ratio).

**Inputs for the transition period**

- Length of the transition period is 5 years.
- Growth rate in earnings will decline from 22% in year 5 to 8% in year 10 in linear increments.
- Payout ratio will increase from 25% to 60% over the same period in linear increments.
- Beta will drop from 1.20 to 1.00 over the same period in linear increments.
- Risk free rate is 4.5%.
- Market rate of return is 10%.

You are **required** to

- a. Estimate the share price of HIL as on March 31, 2006.
- b. Estimate the share price of HIL using Three Stage Dividend Discount Model, if under the transition period only growth rate changes other things remaining same as high growth period.

(6 + 5 = 11 marks)



Answer:

2. a.

| Year  | EPS    | Growth rate | DP   | DPS   | Beta | Rf  | Rm  | Ke (%) | D rate | PV      |                              |
|---|--------|-------------|------|-------|------|-----|-----|--------|--------|---------|------------------------------|
| 0   | 26     |             |      |       |      |     |     |        |        |         |                              |
| 1   | 31.72  | 22%         | 0.25 | 7.93  | 1.2  | 5.5 | 12% | 13.3   | 1.133  | 7.00    |                              |
| 2   | 38.70  | 22%         | 0.25 | 9.67  | 1.2  | 5.5 | 12% | 13.3   | 1.284  | 7.54    |                              |
| 3   | 47.21  | 22%         | 0.25 | 11.80 | 1.2  | 5.5 | 12% | 13.3   | 1.454  | 8.12    |                              |
| 4   | 57.60  | 22%         | 0.25 | 14.40 | 1.2  | 5.5 | 12% | 13.3   | 1.648  | 8.74    |                              |
| 5   | 70.27  | 22%         | 0.25 | 17.57 | 1.2  | 5.5 | 12% | 13.3   | 1.867  | 9.41    |                              |
| 6   | 83.76  | 19.20%      | 0.32 | 26.80 | 1.16 | 4.5 | 10% | 10.88  | 2.070  | 12.95   |                              |
| 7   | 97.50  | 16.40%      | 0.39 | 38.02 | 1.12 | 4.5 | 10% | 10.66  | 2.291  | 16.60   |                              |
| 8   | 110.76 | 13.60%      | 0.46 | 50.95 | 1.08 | 4.5 | 10% | 10.44  | 2.530  | 20.14   |                              |
| 9   | 122.72 | 10.80%      | 0.53 | 65.04 | 1.04 | 4.5 | 10% | 10.22  | 2.789  | 23.32   | 113.81                       |
| 10  | 132.54 | 8.00%       | 0.6  | 79.52 | 1    | 4.5 | 10% | 10     | 3.067  | 25.93   | 1296.259<br>(Terminal value) |
| Share price as on 31 <sup>st</sup> March 2006 |        |             |      |       |      |     |     |        |        | 1410.07 |                              |

b.

$$\text{Value} = \frac{D_1(1+g)}{K_e - g} + \frac{D_5 H(g_s - g_p)}{K_e - g}$$

$$\text{Value} = V_5 = 358.03 + 116.03 = 474.06$$

Therefore present value of company =

| Year         | DPS   | D rate | PV           |
|--------------|-------|--------|--------------|
| 0            |       |        |              |
| 1            | 7.93  | 1.13   | 7.02         |
| 2            | 9.67  | 1.28   | 7.56         |
| 3            | 11.80 | 1.45   | 8.14         |
| 4            | 14.40 | 1.64   | 8.76         |
| 5            | 17.57 | 1.86   | 9.43         |
| <b>Total</b> |       |        | <b>40.91</b> |

$$\frac{17.57(1+0.08)}{0.1330-0.08} + \frac{17.57(2.5)(0.22-0.08)}{0.1330-0.08}$$

$$474.06/1.133^5 + 40.91 = \text{Rs.}294.82.$$

Or

| Year  | Growth rate | DPS   | D rate | PV    |                              |
|---|-------------|-------|--------|-------|------------------------------|
| 0   |             | 6.25  |        |       |                              |
| 1   | 22          | 7.93  | 1.133  | 7.00  |                              |
| 2   | 22          | 9.67  | 1.284  | 7.54  |                              |
| 3   | 22          | 11.80 | 1.454  | 8.12  |                              |
| 4   | 22          | 14.40 | 1.648  | 8.74  |                              |
| 5   | 22          | 17.57 | 1.867  | 9.41  |                              |
| 6   | 19.20       | 20.94 | 2.115  | 9.90  |                              |
| 7   | 16.40       | 24.37 | 2.397  | 10.17 |                              |
| 8   | 13.60       | 27.69 | 2.715  | 10.20 |                              |
| 9   | 10.80       | 30.68 | 3.077  | 9.97  | 81.04 (Dividend total)       |
| 10  | 8.00        | 33.13 | 3.077  | 10.77 | 203.1797<br>(Terminal value) |
| Share price as on 31 <sup>st</sup> March 2006 |             |       |        |       | 284.22                       |

5. Following table shows the price of Satyam Computers Ltd., NSE index and the IT industry index of NSE.

| Year | Nifty   | CNX IT  | Satyam |
|------|---------|---------|--------|
| 2001 | 1254.30 | 2878.36 | 314.70 |
| 2002 | 1055.30 | 1807.29 | 227.20 |
| 2003 | 1100.15 | 1927.47 | 279.65 |
| 2004 | 1912.25 | 2391.19 | 375.00 |
| 2005 | 2115.00 | 2969.40 | 412.50 |
| 2006 | 2810.15 | 3857.35 | 721.45 |

As a technical Analyst you are **required** to

- a. Make use of the given data for analyzing stock of Satyam Computers.
- b. Comment on the performance of the company based on part (a).

5. a. Stock prices tend to move more or less in tandem with the overall market trend, represented by a market index. When the price chart of an industry, or an individual stock diverts from the course chartered by an index, the concept of relative strength can be used to study such divergence.

| Year | Nifty   | CNX IT  | Satyam | RS Index with Nifty | RS Index with industry |
|------|---------|---------|--------|---------------------|------------------------|
| 2001 | 1254.30 | 2878.36 | 314.70 | 0.2509              | 0.1093                 |
| 2002 | 1055.30 | 1807.29 | 227.20 | 0.2153              | 0.1257                 |
| 2003 | 1100.15 | 1927.47 | 279.65 | 0.2542              | 0.1451                 |
| 2004 | 1912.25 | 2391.19 | 375.00 | 0.1961              | 0.1568                 |
| 2005 | 2115.00 | 2969.40 | 412.50 | 0.1950              | 0.1389                 |
| 2006 | 2810.15 | 3857.35 | 721.45 | 0.2567              | 0.1870                 |

b. Relative strength arises out of inherent merit of an industry or stock to recover from a bear market to peak out earlier than most of the stocks trading in the market.

A rising RS index indicates that the stock is doing better and vice versa. RS index also follows trends reversal of which signifies changes in the relative strength of the stock. RS indexes are normally used in the stock selection.

The RS index of the stock with the nifty and the industry shows that during this year the stock has performed better. The RS index with the industry is continuously rising and shows better performance.

When a stock and its relative strength (in terms of the market) are plotted together on a graph, the relative strength generally reverses ahead of the stock prices. Analyst however, waits for the stock to reverse before acting on the basis of relative strength alone.

**Q Indo Medical Labs designs, manufactures and markets all the necessary equipment for mid range and super specialty hospitals. The company had reported earnings per share of Rs.1.50 in 2005, on which it paid no dividends. It had revenues of Rs.7.89 per share in 2005. It had capital expenditures of Rs.0.38 per share in 2005 and depreciation of Rs.0.16 per share in the same year. Earnings and revenues are expected to grow 20% a year during the high growth period. The earnings growth rate is expected to decline linearly over the following five years to a rate of 5% in 2015 and then stabilize at that rate. During the high growth and transition periods, capital spending and depreciation are expected to grow at the same rate as earnings, but are expected to offset each other when the firm reaches steady state. The working capital was 65% of revenues in 2005 and is expected to remain the same till 2015. The debt ratio for the company is 10%.**

**The stock is expected to have a beta of 1.45 for the high growth period (2006-2010), and it is expected to decline to 1.10 by the time the firm goes into steady state (in 2015). The risk-free rate is 5.5%, and the market return is 12%.**

**You are required to estimate the present value per share, using the Three-Stage FCFE model.**

2. Value of the stock = PV of FCFE in high growth phase + PV of FCFE in transition phase + PV of terminal price at the end of transition period.

$$\text{FCFE} = \text{Earnings} - (\text{Capital Expenditure} - \text{Depreciation}) (1 - b) - (\text{Change in working capital}) (1-b)$$

Where, b = debt ratio

| High Growth Period            |         |         |         |          |         |
|-------------------------------|---------|---------|---------|----------|---------|
|                               | 1       | 2       | 3       | 4        | 5       |
| Year                          | 2006    | 2007    | 2008    | 2009     | 2010    |
| Earnings                      | 1.8     | 2.16    | 2.59    | 3.11     | 3.73    |
| Cap Exp - Depreciation (a)    | 0.26    | 0.32    | 0.38    | 0.46     | 0.55    |
| Change in working capital (b) | 1.03    | 1.23    | 1.48    | 1.77     | 2.13    |
| (c) = (a) + (b)               | 1.294   | 1.5468  | 1.86016 | 2.226192 | 2.67743 |
| (c) (1-B)                     | 1.16    | 1.39    | 1.67    | 2.00     | 2.41    |
| FCFE                          | 0.64    | 0.77    | 0.92    | 1.11     | 1.32    |
| PV Factor                     | 1.14925 | 1.14925 | 1.14925 | 1.14925  | 1.14925 |
| PV                            | 0.55    | 0.58    | 0.60    | 0.63     | 0.66    |

| Transition Period             |        |         |        |         | Stable growth |
|-------------------------------|--------|---------|--------|---------|---------------|
|                               | 6      | 7       | 8      | 9       | 10            |
| Year                          | 2011   | 2012    | 2013   | 2014    | 2015          |
| Growth rate                   | 17%    | 14%     | 11%    | 8%      | 5%            |
| Earnings                      | 4.36   | 4.98    | 5.52   | 5.96    | 6.26          |
| Cap Exp - Depreciation (a)    | 0.64   | 0.73    | 0.81   | 0.88    | 0.92          |
| Change in working capital (b) | 2.17   | 2.09    | 1.87   | 1.51    | 1.02          |
| (c) = (a) + (b)               | 2.81   | 2.82    | 2.68   | 2.39    | 1.94          |
| (c) (1-B)                     | 2.53   | 2.54    | 2.42   | 2.15    | 1.75          |
| FCFE                          | 1.83   | 2.43    | 3.11   | 3.81    | 4.51          |
| beta                          | 1.38   | 1.31    | 1.24   | 1.17    | 1.1           |
| Cost of equity                | 1.1447 | 1.14015 | 1.1356 | 1.13105 | 1.1265        |
| PV of FCFE                    | 0.80   | 0.93    | 1.05   | 1.13    |               |

|  |          |
|--|----------|
| FCFE in terminal year                      | Rs.4.51  |
| Terminal Value at the end of 2014*         | Rs.58.95 |
| PV of Terminal Value (a)                   | Rs.17.54 |
| Cost of equity                             | 12.65%   |
| Total of cash flow of growth phase (b)     | Rs.3.02  |
| Total of cash flow of transition phase (c) | Rs.3.91  |
| Value of the stock (a+b+c)                 | Rs.24.47 |

\*Terminal value at the end of year 2014 =  $4.51 / (0.1265 - 0.05) = 58.95$

\*PV of terminal value =  $58.95 / (1.14925)^5 / 1.1447 / 1.1402 / 1.1356 / 1.1311 = \text{Rs.}17.54$

**\*Working note:**

Computation of Change in working capital:

| Year | Revenue Per Share | working capital (0.65 x Revenue) | Change in W.C |
|------|-------------------|----------------------------------|---------------|
| 2005 | 7.89              | 5.13                             |               |
| 2006 | 9.47              | 6.15                             | 1.03          |
| 2007 | 11.36             | 7.39                             | 1.23          |
| 2008 | 13.63             | 8.86                             | 1.48          |

|      |       |       |      |
|------|-------|-------|------|
| 2009 | 16.36 | 10.63 | 1.77 |
| 2010 | 19.63 | 12.76 | 2.13 |
| 2011 | 22.97 | 14.93 | 2.17 |
| 2012 | 26.19 | 17.02 | 2.09 |
| 2013 | 29.07 | 18.89 | 1.87 |
| 2014 | 31.39 | 20.40 | 1.51 |
| 2015 | 32.96 | 21.43 | 1.02 |

[<TOP>](#)

3. Considering that the assumptions of CAPM are valid, fill in the blanks in the following table:

| Stock               | Expected Return (%) | $\sigma_i$ (%) | $\rho_{i,m}$ | Systematic Risk (%) <sup>2</sup> |
|---------------------|---------------------|----------------|--------------|----------------------------------|
| Akhil Infotech Ltd. | –                   | 7              | –            | 12                               |
| Bewan Pharma Ltd.   | 9                   | –              | 1.05         | 5                                |
| Cute Textiles Ltd.  | 14                  | –              | 1.2          | 18                               |

Assume that the variance on the market return is 9(%)<sup>2</sup>.

(5 marks)

3.

$$\text{Systematic risk} = \beta_i^2 \sigma_m^2$$

$$\beta_i^2 = \frac{\text{Systematic risk}}{\sigma_m^2}$$

$$\beta_A^2 = \frac{12}{9}$$

$$\beta_A = 1.15$$

Similarly,

$$\beta_B^2 = \frac{5}{9} \Rightarrow \beta_B = 0.75$$

$$\beta_C^2 = \frac{18}{9} \Rightarrow \beta_C = 1.41$$

According to the CAPM,

$$R_i = R_f + \beta (R_m - R_f)$$

$$R_B = R_f + 0.75 (R_m - R_f) \dots\dots\dots (1)$$

$$R_C = R_f + 1.41 (R_m - R_f) \dots\dots\dots (2)$$

(2) – (1) will give

$$14 - 9 = (1.41 - 0.75) (R_m - R_f)$$

$$(R_m - R_f) = 7.58\%$$

Substituting in (1),

$$9 = R_f + 0.75 \times 7.58$$

$$R_f = 3.31\%$$

$$R_A = 3.31 + 1.15 (7.58) = 12.03\%$$

Again Systematic risk can be expressed as  $\beta_{i,m}^2 \sigma_i^2$

$$\sigma_B^2 = \frac{\text{Systematic risk}}{\rho_{im}^2}$$

$$= \frac{5}{(1.05)^2} = \frac{5}{1.1025} = 4.535$$

$$\sigma_B = 2.13\%$$

$$\sigma_C^2 = \frac{18}{(1.2)^2} = \frac{18}{1.44} = 12.5$$

$$\sigma_C = 3.54\%$$

$$\rho_{im} = \frac{\text{Systematic risk}}{\sigma_{im}^2} = \frac{12}{14} = 0.9$$

5. A market analyst is keen on testing whether the Indian markets are exhibiting semi-strong form of efficiency. For the purpose he selected three companies, viz., Arun Motors Ltd., Bimal Infotech Ltd. and Celine Airlines Ltd., which declared higher dividends on March 15, 2006. He estimated the characteristic lines to study the relationship between the returns on these three companies and the return on the market index for a period of five years on a monthly basis up to December 15, 2005, which are as follows:

$$r_{A,t} = 1.40\% + 0.75r_{m,t}$$

$$r_{B,t} = 1.59\% + 1.23r_{m,t}$$

$$r_{C,t} = 1.92\% + 1.40r_{m,t}$$

The following table shows the returns on the stocks of the three companies and the market return for the period three months before and three months after the declaration of dividend:

| Period (months) | Actual Return (%) |           |           | Market Return (%) $r_{m,t}$ |
|-----------------|-------------------|-----------|-----------|-----------------------------|
|                 | $r_{A,t}$         | $r_{B,t}$ | $r_{C,t}$ |                             |
| Dec 15, 2005    | 12.14             | 12.56     | 13.05     | 11.45                       |
| Jan 15, 2006    | 12.52             | 12.79     | 13.42     | 11.85                       |
| Feb 15, 2006    | 12.05             | 13.04     | 13.58     | 12.00                       |
| Mar 15, 2006    | 11.89             | 12.43     | 13.25     | 12.25                       |
| Apr 15, 2006    | 12.63             | 13.62     | 14.42     | 12.60                       |
| May 15, 2006    | 12.16             | 13.16     | 14.20     | 11.95                       |
| Jun 15, 2006    | 12.84             | 13.32     | 14.45     | 11.20                       |

You are **required** to verify the validity of semi-strong form of market efficiency in the Indian market using Event Studies.

(8 marks)

5. First we should find out abnormal return by deducting the actual return from the expected return  
**Arun Motors Ltd:**

| Period | Actual return ( $r_{At}$ ) | Market return ( $r_{Mt}$ ) | Expected return (%) $1.4+0.75(r_{mt})$ | Abnormal return $r_{At} - r_{mt}$ |
|--------|----------------------------|----------------------------|--|-----------------------------------|
| 3      | 12.14                      | 11.45                      | 9.9875                                 | 2.1525                            |
| 2      | 12.52                      | 11.85                      | 10.2875                                | 2.2325                            |
| 1      | 12.05                      | 12                         | 10.4                                   | 1.65                              |
| 0      | 11.89                      | 12.25                      | 10.5875                                | 1.3025                            |
| 1      | 12.63                      | 12.6                       | 10.85                                  | 1.78                              |
| 2      | 12.16                      | 11.95                      | 10.3625                                | 1.7975                            |
| 3      | 12.84                      | 11.2                       | 9.8                                    | 3.04                              |

**Bimal Infotech Ltd:**

| Period | Actual return ( $r_{Bt}$ ) | Market return ( $r_{Mt}$ ) | Expected return (%) $1.59+1.23(r_{mt})$ | Abnormal return $r_{Bt} - r_{mt}$ |
|--------|----------------------------|----------------------------|---|-----------------------------------|
| 3      | 12.56                      | 11.45                      | 15.6735                                 | -3.1135                           |
| 2      | 12.79                      | 11.85                      | 16.1655                                 | -3.3755                           |
| 1      | 13.04                      | 12                         | 16.35                                   | -3.31                             |
| 0      | 12.43                      | 12.25                      | 16.6575                                 | -4.2275                           |
| 1      | 13.62                      | 12.6                       | 17.088                                  | -3.468                            |
| 2      | 13.16                      | 11.95                      | 16.2885                                 | -3.1285                           |
| 3      | 13.32                      | 11.2                       | 15.366                                  | -2.046                            |

**Celine Airlines Ltd:**

| Period | Actual return ( $r_{Ct}$ ) | Market return ( $r_{Mt}$ ) | Expected return (%) $1.92+1.40(r_{mt})$ | Abnormal return $r_{Ct} - r_{mt}$ |
|--------|----------------------------|----------------------------|---|-----------------------------------|
| 3      | 13.05                      | 11.45                      | 17.95                                   | -4.9                              |
| 2      | 13.42                      | 11.85                      | 18.51                                   | -5.09                             |
| 1      | 13.58                      | 12                         | 18.72                                   | -5.14                             |
| 0      | 13.25                      | 12.25                      | 19.07                                   | -5.82                             |
| 1      | 14.42                      | 12.6                       | 19.56                                   | -5.14                             |
| 2      | 14.2                       | 11.95                      | 18.65                                   | -4.45                             |
| 3      | 14.45                      | 11.2                       | 17.6                                    | -3.15                             |

We will now estimate the average abnormal return to each of the months before and after the dividend was announced.

Third month before the announcement of dividend

$$AAR_{(-3)} = \frac{1}{3}(2.125 - 3.115 - 4.9) = -1.954\%$$

Second month before the announcement of dividend

$$AAR_{(-2)} = \frac{1}{3}(2.2325 - 3.3755 - 5.09) = -2.078\%$$

First month before the announcement of dividend

$$AAR_{(-1)} = \frac{1}{3}(1.65 - 3.31 - 5.14) = -2.267\%$$

Month during which the dividend was announced

$$AAR_{(0)} = \frac{1}{3}(1.3025 - 4.2275 - 5.82) = -2.915\%$$

First month after the announcement of dividend

$$AAR_{(1)} = \frac{1}{3}(1.78 - 3.468 - 5.14) = -2.276\%$$

Second month after the announcement of dividend

$$AAR_{(2)} = \frac{1}{3}(1.7975 - 3.1285 - 4.45) = -1.927\%$$

Third month after the announcement of dividend

$$AAR_{(3)} = \frac{1}{3}(3.04 - 2.046 - 3.15) = -0.719\%$$

Now we will compute the cumulative Average Abnormal returns (CAAR) for the period of three months before and after the announcement of dividend.

$$CAAR = (-1.954 - 2.078 - 2.267 - 2.915 - 2.276 - 1.927 - 0.719) = -14.135\%$$

As the value of CAAR is not close to zero, we conclude that market is not efficient in the semi-strong form.

1. Consider the following information relating to the returns from two stocks and the market index in different economic scenarios:

| Scenario    | Probability of scenario | Return (%) |         |        |
|-------------|-------------------------|------------|---------|--------|
|             |                         | Stock A    | Stock B | Market |
| Boom        | 0.25                    | 19.5       | 26.0    | 17.0   |
| Slow growth | 0.35                    | 11.0       | 18.5    | 13.0   |
| Stagnation  | 0.25                    | -3.5       | 7.0     | 5.5    |
| Recession   | 0.15                    | 4.0        | 5.5     | -4.5   |

From the above information, you are **required** to:

- Calculate the proportion of unsystematic risk in the total risk for the two stocks.
- Determine the alpha of the two stocks and comment on the same if SML holds good. Assume a risk free rate of interest of 6.5%.

Answer:

1.

| RM    | Pi   | RM Pi  | RM - E(RM) | [RM - E(RM)] <sup>2</sup> | [RM - E(RM)] <sup>2</sup> *Pi |
|-------|------|--------|------------|---------------------------|-------------------------------|
| 17    | 0.25 | 4.25   | 7.5        | 56.25                     | 14.0625                       |
| 13    | 0.35 | 4.55   | 3.5        | 12.25                     | 4.2875                        |
| 5.5   | 0.25 | 1.375  | -4         | 16                        | 4                             |
| -4.5  | 0.15 | -0.675 | -14        | 196                       | 29.4                          |
| Total |      | 9.5    |            |                           | 51.75                         |

Return 9.5  
 Variance 51.75  
 Standard Deviation 7.193747

| R <sub>A</sub> | P <sub>i</sub> | R <sub>A</sub> P <sub>i</sub> | R <sub>A</sub> - E(R <sub>A</sub> ) | R <sub>M</sub> - E(R <sub>M</sub> ) | R <sub>A</sub> - E(R <sub>A</sub> ) <sup>2</sup> | R <sub>A</sub> - E(R <sub>A</sub> ) <sup>2</sup> *P <sub>i</sub> | [R <sub>A</sub> - E(R <sub>A</sub> )]*[R <sub>M</sub> - E(R <sub>M</sub> )] | [R <sub>A</sub> - E(R <sub>A</sub> )]*[R <sub>M</sub> - E(R <sub>M</sub> )]*P <sub>i</sub> |
|----------------|----------------|-------------------------------|-------------------------------------|-------------------------------------|--|--|---|--|
| 19.5           | 0.25           | 4.875                         | 11.05                               | 7.5                                 | 122.1025   | 30.525625  | 82.875  | 20.71875   |
| 11             | 0.35           | 3.85                          | 2.55                                | 3.5                                 | 6.5025   | 2.275875   | 8.925   | 3.12375  |
| -3.5           | 0.25           | -0.875                        | -11.95                              | -4                                  | 142.8025   | 35.700625  | 47.8  | 11.95  |
| 4              | 0.15           | 0.6                           | -4.45                               | -14                                 | 19.8025  | 2.970375   | 62.3  | 9.345  |
| Total          |                | 8.45                          |                                     |                                     |  | 71.4725  | 201.9   | 45.1375  |

Return 8.45  
 Variance 71.4725  
 Standard Deviation 8.454141  
 Covariance between stock A and the market index 45.1375

| RB    | P <sub>i</sub> | RB P <sub>i</sub> | RB - E(RB) | R <sub>M</sub> - E(R <sub>M</sub> ) | RB - E(RB) <sup>2</sup> | [RB - E(RB)] <sup>2</sup> *P <sub>i</sub> | [RB - E(RB)]*[R <sub>M</sub> - E(R <sub>M</sub> )] | [RB - E(RB)]*[R <sub>M</sub> - E(R <sub>M</sub> )]*P <sub>i</sub> |
|-------|----------------|-------------------|------------|-------------------------------------|-------------------------|---|--|---|
| 26    | 0.25           | 6.5               | 10.45      | 7.5                                 | 109.2025                | 27.300625                                 | 78.375   | 19.59375  |
| 18.5  | 0.35           | 6.475             | 2.95       | 3.5                                 | 8.7025                  | 3.045875                                  | 10.325   | 3.61375   |
| 7     | 0.25           | 1.75              | -8.55      | -4                                  | 73.1025                 | 18.275625                                 | 34.2   | 8.55  |
| 5.5   | 0.15           | 0.825             | -10.05     | -14                                 | 101.0025                | 15.150375                                 | 140.7  | 21.105  |
| Total |                | 15.55             |            |                                     |                         | 63.7725                                   | 263.6  | 52.8625   |

Return 15.55  
 Variance 63.7725  
 Stand Deviation 7.985769  
 Covariance between stock B and the market index 52.8625

$$\text{Beta}_A = \frac{\text{Cov}_{AM}}{\text{Var}_M} = \frac{[(R_A - E(R_A))][R_M - E(R_M)]P_i}{\text{Var}_M} = \frac{45.1375}{51.75} = 0.872$$

$$\text{Beta}_B = \frac{\text{Cov}_{BM}}{\text{Var}_M} = \left\langle \frac{52.8625}{51.75} \right\rangle = 1.021$$

$$\text{Unsystematic Risk} = \text{Total Risk} - \text{Systematic risk} = \sigma^2 - \beta^2 \sigma_M^2$$

$$\text{Stock A} = 71.4725 - (0.872)^2 \times 51.75 = 32.10257 (\%)^2$$

$$\text{Stock B} = 63.7725 - (1.021)^2 \times 51.75 = 9.7736 (\%)^2$$

Proportion of unsystematic risk

$$\text{Stock A} = \frac{32.10257}{71.4725} = 44.92\%$$

$$\text{Stock B} = \frac{9.7736}{63.7725} = 15.33\%$$

b.  $R_A = R_f + \beta_A (R_M - R_f)$   
 $= 6.5 + 0.872 (9.5 - 6.5)$   
 $= 9.117 \%$

$$\alpha_A = E(R_A) - \text{Required return}$$

$$= 8.45 - 9.117 = -0.667$$

As alpha is negative, Stock A is overvalued

$$R_B = 6.5 + 1.021 (9.5 - 6.5)$$

$$= 9.564\%$$

$$\alpha_B = 15.55 - 9.564 = 5.986\%$$

As alpha is positive, Stock B is undervalued.



3. Being a financial analyst you have discovered that an announcement regarding outsourcing contracts of animation films and creation of special effects for Hollywood films has induced a sharp interest in the scrip of Animator Tele in the bourse. To check the market efficiency in semi-strong form in the case, you have collected the following relevant information:

| End of Month   | Closing Price of Animator Tele (₹) | Closing Value of Market |
|----------------|------------------------------------|-------------------------|
| May 2004       | 523.5                              | 2030                    |
| June 2004      | 589.35                             | 2170                    |
| July 2004      | 588.6                              | 2190                    |
| August 2004    | 623.55                             | 2203                    |
| September 2004 | 632.75                             | 2122                    |
| October 2004   | 677.95                             | 2217                    |
| November 2004  | 759.85                             | 2256                    |
| December 2004  | 807.55                             | 2318                    |
| January 2005   | 803.75                             | 2302                    |
| February 2005  | 893.95                             | 2356                    |

Further using the data for 3 previous years, the characteristic line arrived by Mr. Gupta is

$$r_{s,t} = 3.85 + 0.73r_{m,t}$$

Where  $r_{m,t}$  is % monthly return on market in any month t

$r_{s,t}$  is % monthly return on Optima stock in the same month t

You are **required** to conduct the residual analysis to test semi-strong form of market efficiency

(9 marks) < Answer >

Answer:

3.

| Months<br>(I)           | Actual Return on stock (%)<br>(II) | Return on Index (%)<br>(III) | Expected return on Reddy's stock using characteristic line<br>(IV) | Above normal return %<br>(V) = (II) - (IV) |
|-------------------------|------------------------------------|------------------------------|--|--|
| May, 04                 |                                    |                              |  | -  |
| June, 04                | 12.579                             | 6.897                        | 8.884  | 3.694                                      |
| July, 04                | -0.127                             | 0.922                        | 4.523  | -4.650                                     |
| Aug,04                  | 5.938                              | 0.594                        | 4.283  | 1.654                                      |
| Sept,04                 | 1.475                              | -3.677                       | 1.166  | 0.309                                      |
| Oct,04                  | 7.143                              | 4.477                        | 7.118  | 0.025                                      |
| Nov,04                  | 12.081                             | 1.759                        | 5.134  | 6.946                                      |
| Dec,04                  | 6.278                              | 2.748                        | 5.856  | 0.421                                      |
| Jan,05                  | -0.471                             | -0.690                       | 3.346  | -3.817                                     |
| Feb,05                  | 11.222                             | 2.346                        | 5.563  | 5.659                                      |
| Σ Above normal return = |                                    |                              |  | 10.240                                     |

From the above computation we observe that sum of abnormal return is not close to zero. Therefore, we conclude that market is not efficient in semi-strong form.

The stock of Hindustan Oil Exploration Company Ltd. (HOEC) is currently trading at Rs.105.95. Based on the current market price, the P/E ratio is 16.18, P/B ratio is 3.91 and P/S ratio is 6.73.

Other fundamentals of HOEC are given below: (In millions)

|                                 |         |
|---------------------------------|---------|
| Sales                           | 924.54  |
| Net profit                      | 384.84  |
| Net worth                       | 1593.25 |
| Dividend per share              | 1       |
| Number of shares of Rs.10 each. | 58.75   |
| Beta                            | 2       |

The yield on the one-year treasury bill is 5.5% and the equity risk premium in the market is 8.00%.

You are **required** to

- Determine the required rate of return for equity holders and the sustainable growth rate of HOEC Ltd.
- Estimate the P/E, P/B and P/S ratios justified by the fundamentals.
- Based on your answer in part (b), explain whether the stock is fairly valued, overvalued or undervalued.

(1 + 6 + 3 = 10 marks)

Answer:

- Required rate of return =  $5.5 + 2(8) = 21.5\%$

Here,  $g = ROE \times b = 0.2415 \times 0.8473 = 20.46\%$

- Net Profit margin =  $\frac{384.84}{924.54} = 41.63\%$

Return on equity =  $\frac{384.84}{1593.25} = 24.15\%$

EPS =  $\frac{384.84}{58.75} = \text{Rs.}6.55$

Dividend payout ratio =  $\frac{1}{6.55} = 15.27\%$

Retention ratio =  $1 - 0.1527 = 0.8473$

- $P/E = \frac{(1-b)(1+g)}{K_e - g} = \frac{0.1527 \times 1.2046}{0.215 - 0.2046} = 17.68$

- $P/B = \frac{ROE - g}{K_e - g} = \frac{0.2415 - 0.2046}{0.215 - 0.2046} = 3.55$

- $P/S = \frac{NPM \times (1-b) \times (1+g)}{K_e - g} = \frac{0.4163 \times 0.1527 \times 1.2046}{0.215 - 0.2046} = 7.36$

- The calculated P/E is more than the current P/E, Therefore as per P/E stock is undervalued.
  - The calculated P/B is less than the current P/B, Therefore as per P/B stock is slightly overvalued.
  - The calculated P/S is greater than the current P/S, Therefore as per P/S stock is undervalued.

**Theoretical Questions**

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**Q. Listing means admission of securities for trading on a stock exchange. It is done through a formal agreement between the stock exchange and the company. In this context, explain how listing of securities is advantageous to the company as well as to the investor. Also explain various types of listing of securities.**

**A. Advantages of Listing**

Listing of securities on the stock exchanges is advantageous to the company as well as to the investors as seen hereunder:

**a. To the Company**

- i. The company enjoys concessions under Direct Tax Laws - In such companies the public is substantially interested resulting in lower rate of income tax payable by them;
- ii. The company gains national and international importance by its share value quoted on the stock exchanges;
- iii. Financial institutions/bankers extend term loan facilities in the form of rupee currency and foreign currency loan;
- iv. It helps the company to mobilize resources from the shareholders through 'Rights Issue' for programs of expansion and modernization without depending on the financial institutions in line with the government policies;
- v. It ensures wide distribution of shareholding thus avoiding fears of easy takeover of the organization by others.

**b. To the Investors**

- i. Since the securities are officially traded, liquidity of investment by the investors is well ensured;
- ii. Rights entitlement in respect of further issues can be disposed of in the market;
- iii. Listed securities are well preferred by bankers for extending loan facility;
- iv. Official quotations of the securities on the stock exchanges corroborate the valuation taken by the investors for purposes of tax assessments under Income Tax Act, Wealth Tax Act, etc.;
- v. Since securities are quoted, there is no secrecy of the price realization of securities sold by the investors;
- vi. The rules of the stock exchange protect the interest of the investors in respect of their holdings;
- vii. Listed companies are obligated to furnish unaudited financial results on a half-yearly basis within two months of the expiry of the period. The said details enable the investing public to appreciate the financial results of the company in between the financial year;
- viii. Takeover offers concerning listed companies are to be announced to the public. This will enable the investing public to exercise its discretion on such matters.

**Types of Listing**

Listing of securities is of five types as follows:

**Initial Listing**

A company, whose securities have not been listed earlier in a recognized stock exchange, if desirous of listing its securities, should follow procedures applicable to initial listing.

**Listing of Public Issue of Shares and/or Debentures**

A company whose shares are listed on a recognized stock exchange may issue shares and/or debentures to the public for subscription. In such cases the company under the Listing Agreement has to submit necessary application to the stock exchange(s) for listing of its securities. It may so happen that a green field company, i.e., a company shortly after incorporation may issue its shares and/or debentures to the public for subscription. In that event, it has to comply with the formalities applicable to initial listing.

**Listing of Rights Issue of Shares and/or Debentures**

Companies whose securities are already listed may issue shares and/or debentures by way of 'rights' to the existing shareholders. Under the listing agreement, such companies have to list shares and/or debentures allotted by way of rights to the shareholders with stock exchange(s).

**Listing of Bonus Issue of Shares**

Companies which issue bonus shares by capitalization of its reserves, pursuant to the listing agreement should enlist with the stock exchange(s). Bonus shares should issue by submitting necessary application form for official quotation of the bonus shares.

**Listing of Shares Issued on Amalgamation, Mergers, etc.**

Amalgamated companies, which issue shares to the shareholders have to get the shares listed on the stock exchanges to enable the erstwhile shareholders with such shares.

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**Q Trading procedures differ across different equity markets according to their operational set up and legal obligations. With respect to this, discuss the various differences seen in trading procedures.**

#### **Differences in Trading Procedures**

Trading procedures differ across different equity markets according to their operational set-up and legal obligations. The most important differences are given below.

##### **Cash Vs Forward Markets**

Cash settlement is very popular in most of the stock markets, where transactions should be settled within a short span of time. Margin trading is also available in these markets. The United States, Canada, Japan and Switzerland are good examples of the cash markets. Margin trading is an integral part of these markets.

Forward stock market gives a good base for levered stock trading. The major forward markets are London, Paris and Rio de Janeiro. The Paris bourses provide an excellent example of forward market. In this market, all transactions are settled at the end of a fixed period, which can be a month or a fortnight. For example, in Paris bourses, all the transactions are settled at the end of the month on the settlement day, whereas in London bourses the deals are settled in a fortnight. So, we can say that forward market follows periodic settlement system. In most forward markets, a deposit is required to guarantee an open position. The main feature of this market is that the price of the stocks remains fixed even if it changes during the settlement period. Settling of the account after a certain fixed period simplifies the trading procedure, but it also attracts opportunity for short-term speculation. On the Paris bourses, both smaller stocks and bonds are traded on cash basis.

##### **Call Vs Continuous Quotation**

A continuous market provides uninterrupted trading throughout the day and market makers ensure the required liquidity for this continuous trading. New York Stock Exchange (NYSE) is a good example of this kind of trading. In NYSE, market maker quotes both the bid and ask price (offer price). These two-way quotes establish the firm responsibility of a market maker, because normal investors transact with the dealers who provide the most favorable price to them. The market makers will adjust their quotation according to the demand and supply of the stock. These types of the markets are often called dealer markets or price driven markets.

In auction markets, active market makers do not exist and demand and supply of the securities is directly related to the transaction price. The trading of the stocks will not be on a continuous basis and any stock can be traded only once or a few times per day. This type of market is called call or fixing market, in which orders are batched together until the auction and are executed at a single price that matches the demand and supply.

Two major types of orders are submitted in an auction market, i.e., market order and limit order. In market order, customer will accept the price fixed in the auction. On the other hand, in limit order system, the price is determined by the maximum price which a customer is willing to give or the minimum price at which the customer is willing to sell the share. When the bourses official writes a higher price, some limit sell orders will be removed from the supply of stocks and some limit buy orders will be added to the demand for shares. This process results in an equilibrium price. In Tokyo, the call auction system determines the morning and afternoon starting price. A call auction market is also called order driven market because all traders openly post their orders and the transaction price is derived through equilibrating the demand and supply of the stock.

##### **Microstructure of the Market**

All stock exchanges in the world are using the electronic technology to automate the trading process. The main purpose of any trading procedure is to discover the best price for investors. The convenient system of trading helps in getting a fair price without providing any favorable term to any counterparty.

Again a good trading procedure helps in reducing the transaction cost and provides a transparent and liquid market. There are several controversial issues in the microstructure of stock trading system. For example, there is a lot of disagreement on how to measure transaction cost. Sometimes, it is called the difference between the price, including commissions and the price of the previous market. In other words, it can be taken as a sum of commissions, taxes and other market impacts.

##### **Price-Driven vs Order-Driven Systems**

Computerized trading systems basically follow two different approaches depending on the dominance of either the dealers or brokers. The London Stock Exchanges Automated Quotation (LSEAQ) and the National Association of

Securities Dealers Automated Quotation (NASDAQ) are price-driven or quote-driven systems. In this kind of trading system, there are no automatic quotes because the market maker does not know the form of the final contract. The quote-driven system allows the market maker to buy a limit order at the bid price and sell it at the offer price.

The Paris, Tokyo and most of the European and Asian markets are order-driven markets. The limit order book is the heart of these trading systems. After assessing the standing orders, a trader can judge the nature of the trade. The NYSE follows a mixture of these two systems. In NYSE, the limit order is in private knowledge of the specialist, and the brokers are likely to keep their limit orders a secret and keep them with their floor brokers to trade in the most suitable manner. In all cases, a limit order gives a free trading option to other market participants. In an order-driven market, it is the trader who submits the order but in a price-driven market, the dealer posts a firm quote and provides free option.

### **Information Emission And Transparency**

Transparency in the market is of utmost importance because it gives the market a kind of stability and proper information about the past and the recent trades. Automation enhances the transparency in the market because a large amount of information is available to the public. The New York Stock Exchange is less transparent, as the limit order book is a private information and cannot be revealed to everybody. Some traders trade on the basis of private information, while some trade with the help of the publicly available information. The presence of the informed traders can create trouble for the normal traders. A well informed trader can pick-up some shares after getting some private information. On the London market, dealers quote for big transactions and the well informed investors can trade with several traders before any of them comes to know about the transaction. Informed traders do not want to disclose the information.

### **Market Fragmentation**

Liberalization and automation of the equity markets have increased the competition among domestic markets as well as the international markets. For example, the London Stock Exchange accounted for 20% to 50% of the total volume of trades in French, Dutch and German shares. Various overseas stocks are traded on the floor of the NYSE. Buying futures on some index is sometimes an alternative to buying a diversified portfolio of shares and this causes fragmentation in the market. Domestic markets are protecting their interest by imposing certain rules to off-exchange trades. The obvious presence of fragmentation and competition has improved the efficiency of the markets.

### **Internationalization**

Development of the global equity market is the first step in the internationalization of equity trading. Many developed countries have opened overseas branches to cater to their foreign investors. The US, Britain, Japan are the main countries to attract the foreign investors. Some stock markets believe that they can safeguard their global interest by establishing links with other markets. This pattern is most famous among the futures and options market. The NASDAQ system is available to the investors in England and Singapore. The international stock exchange in London and the NASDAQ have agreed not to enforce competition among themselves by ignoring the quotes and trading for common shares. Automation of trading procedure has allowed some stock exchanges to attract a significant amount of the foreign company shares.

### **Anonymity and Reputation**

Some investors and traders would prefer to maintain anonymity to get a better price in their deal. On the other hand, market makers and brokers would like to build a reputation for their skills. They try to advertise their competency and skills to attract more clients. In NASDAQ, for small orders, brokers can provide their choice for the particular market makers. But this is a dangerous practice since it weakens the dealer's incentive to publish the best price.

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**Q There are several factors at work in every sector and every industry of an economy. The dynamic nature of every industry keeps the pulses of the companies operating in each sector racing. Industry analysis looks at all those factors that potentially change the fortunes of the company. With respect to this discuss the key characteristics in an Industry Analysis.**

### **8. Key Characteristics In An Industry Analysis**

The most important of the characteristics that are to be evaluated in an Industry Analysis can be enumerated as given below:

1. Past sales and earnings performance.
2. Permanence of the industry.
3. The attitude of the government towards the industry.
4. Labor conditions within the industry.
5. The competitive conditions as reflected by the existence of the entry barriers and
6. The stock prices of the firms in the industry relative to their earnings.

### **Past Sales and Earnings Performance**

For an analyst, the past sales and earnings performance of the firm form a crucial input in forecasting future trends. This is not to say that the firm is going to repeat the same performance again. Rather, the analyst is more interested in examining the contribution of the various factors in the past so that the relevance of these factors individually and relatively can be properly evaluated under present conditions.

In any firm, sales and the earnings play an important role. These variables will exhibit a degree of consistency only when the firm has weathered a variety of economic conditions. The analyst from the observation of these variables will be able to judge the stability of the performance in terms of sales and earnings as well as the growth rates. Another crucial factor is that of the relationship between the sales and the fixed costs. The more the fixed costs, the higher will be the break even point and higher will be the sales volume to be achieved.

### **Permanence**

By permanence, we understand the products and the technology of a particular industry not becoming obsolete in a short span of time. If the industry is not permanent, then investing in that industry altogether becomes a losing proposition. In some of the cases a product with additional features manufactured by employing superior technology makes the existing product totally irrelevant or at least results in the manufacturing process becoming a commercially enviable proposition.

In this age of rapid technological developments, this factor plays a crucial role in Industry Analysis. The Government's role is also an important factor affecting the permanence of the industry.

### **The Attitude of the Government towards the Industry**

It is imperative for an Analyst that he should be well aware of the various Government policies and regulations with reference to an industry in which he is going to invest. The government policies like deregulating an industry by allowing foreign investment, imposing high tariffs on imports and restrictive legislation have a bearing on their performance. Some of the legal restrictions result in the profits being very low for a particular industry. Thus an analyst, for that matter an investor also should be thorough with various government regulations and their implications and should be able to predict, at least broadly, the changes likely to take place in the regulations in the near future.

### **Labor Conditions**

This is an important factor to be considered in industries which are labor intensive. An analyst should examine the various provisions of the labor laws and also go into the possible reasons that may halt the production process and its fallout on the profits of the industry. In case of a prolonged strike, a labor intensive firm will not only lose its customers and goodwill but also may not be able to cover its fixed costs in certain cases.

### **Competitive Conditions**

While analyzing this situation, the three general types of barriers that an analyst should concentrate on, are

1. Existence of product differentiation
2. Absolute cost advantages and
3. Advantages rising from economies of scale.

The existence of the first barrier assures that a new entrant will not be able to charge as much as the existing firms. Also he has to spend large amounts of money on advertising to capture an acceptable share of the market as this situation is usually found in cases where the customers exhibit a high degree of brand loyalty. By absolute cost advantages, we understand that the existing firms are capable of producing and distributing the products at lower costs than the new entrants irrespective of the volume produced. As a result, they enjoy wider profit margins. This may be due to the fact that the existing firms may have exclusive patents, own the resources or superior management skills that are not available to the new entrants.

Economies of scale are usually realized when the production levels are quite high. A new entrant in this case also has to garner a significant market share so that he can avail the benefits from economies of scale. If he fails to do so, he will be able to compete with the prices offered by the existing players.

### **Industry Share Prices Relative to its Earnings**

In addition to the various factors we have been looking at, the analyst also has to look at the present share prices. In this case under priced share would be the best bet. Also he should examine the fact that the share prices are not high due to the overzealous nature of the investors to acquire the shares of the firms in a new industry. Usually the shares of these companies experience high fluctuations depending on the crowd behavior.

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**Q You are given the historical betas and their associated returns of the stocks. You are expected to identify whether these stocks have given returns, which are commensurate with their respective betas. Which technique will you employ? Also state the applications for this technique.**

**Answer:**

In this context we apply the ex post SML technique. In the ex post SML, average historical rates of return for securities are plotted against their betas for a particular time period.

Typically, a straight line is fitted to the plots, by regression and this is called the SML.

Thus, the SML represents the “normal” or average, trade-off between return and risk.

The SML can be written as

$$\text{Normal return: } N(\bar{r}_i) = r_0 + r_i \beta_{im}$$

Where,

$R_0$  = intercept of the SML

$R_i$  = slope of the SML

Those securities which plot above the ex post SML generated above normal returns for their risk (as measured by their beta) for the particular time period used in constructing the SML.

Those securities which plot below the SML generated below normal rates of returns for the systematic risk.

The amount by which a security's return differed from the normal return for its level of risk is simply the vertical distance of the security's plot on the graph from the SML.

This vertical distance is called the security's abnormal return or its alpha.

Thus, alpha is calculated as

$$\left\{ \begin{array}{l} \alpha_i = r_i - N(\bar{r}_i) \\ r_i = (r_i - r_i \beta_{im}) \end{array} \right\} \text{ ex post alpha}$$

It is easy to see that securities with above normal returns have positive alpha and securities with below normal returns have negative alphas.

### Applications of Ex post SMLs

The performance of portfolio managers is frequently evaluated based on security market line-criteria. Large positive alphas indicate above normal performance and negative alphas indicate below normal performance.

Unfortunately, the measurement of performance is not quite as simple as it might first appear.

For the relative performance of a portfolio manager, as measured by alpha, can vary depending upon which index is used to determine the beta of the portfolio.

Perhaps more importantly, one would prefer a measure of performance which is predictive in nature. That is, if a portfolio manager performed well in the past he will also perform well in the future. Unfortunately, no such consistency among portfolio managers has been demonstrated.

Many researchers have attempted to test the validity of the CAPM by constructing *ex post* SML's.

However, these studies are particularly vulnerable since the CAPM specifies that betas are to be measured against the returns for the market portfolio – the value of weighted portfolio of all risky assets.

Since the true “market portfolio” is not observable proxies have to be used in its place and these proxies may give results which are different from those that would be obtained if one was able to use the market portfolio.

Another area of inquiry utilizing ex post SMLs involves the testing of market efficiency.

Broadly speaking efficient markets imply the absence of abnormal returns.

That is, all securities are correctly priced and provide a normal return for their level of risk. Tests of this nature require a model to specify what constitutes a normal return.

Tests of market efficiency which utilize the market model assume that a normal return plots on the SML and that abnormal returns are measured by alpha.

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**Q A number of trading rules exist and each one has to be interpreted differently. Though a majority of technical analysts keep track of alternative rules and decide on a buy or sell decision based on a consensus of the signals, a complete agreement of all the rules is not common. With respect to this, discuss various techniques of trading rules.**

**Answer: Techniques of Trading Rules**

**CONTRARY-OPINION RULES**

This is based on the premise that the technical analysts tend to act in the opposite direction of the majority of investors. When the investors are bullish; technical analysts are bearish and vice versa.

### **MUTUAL FUND CASH POSITION**

This serves as a good proxy for the technical analysts following contrary opinion rules. These technical analysts are of the opinion that mutual funds do not adopt the right strategy during peaks and troughs. Mutual funds held cash for the following reasons:

- To meet the payments towards the purchase of securities from the investors when they sell back to them.
- Idle cash, which is yet to be invested.
- Bearish outlook of the fund managers may trigger them towards the maintenance of extra cash as a defensive strategy.

Whatever be the reason, mutual funds are known to maintain a high percentage of cash near the trough of a market cycle. This implies that they are bearish and they should be fully invested to take advantage of the expected market rise. But at the peak, technical analysts expect mutual funds to hold a low percentage of cash. This indicates a bearish outlook by the mutual funds and they would be selling stocks and realizing gains on some part of their portfolios. Similarly, if mutual funds maintain a high cash position, it will signify a bullish attitude by the mutual funds and they are expected to engage in buying stock with excess cash. Contrary opinion technicians would keep a close watch on the cash position of the mutual funds and would act in the opposite direction.

### **CREDIT BALANCES IN BROKERAGE ACCOUNTS**

Brokerage accounts are left with credit balances when the investors sell stocks and leave the proceeds with brokers for a brief period of time till some other stocks are purchased or such funds are withdrawn to be invested elsewhere. Technical analysts view these credit balances as pools of potential purchasing power. In addition, if there is any drop in these balances, it is interpreted as a bearish signal indicating lower purchasing power as the market approaches a peak. Similarly, an increase in credit balances can be viewed as an increase in buying power and thus indicating a bullish signal.

### **INVESTMENT ADVISORY OPINIONS**

If a majority of investment advisors share a bearish attitude about the market, then the technicians expect a market trough and the onset of the bull market. As most investment advisory services are expected to follow the trend, the number of bears will be more when market bottoms are approaching. This trading rule is developed based on the ratio of the number of advisory services to the number of services expressing an opinion. For instance, a "bearish sentiment index" of 60 would indicate that a bearish attitude is prevalent among advisory services and the contrarians would therefore consider this a bullish indicator. Similarly, when the bearish sentiment index falls below 20%, it indicates the prevalence of a bullish attitude among advisory services and the contrarian would therefore act according to their bearish sentiment.

### **OTC VS SENSEX VOLUME**

Another measure usually followed by technical analysts is the ratio of OTC volume on the BSE to SENSEX volume. This ratio is used by them for speculative trading.

### **PUT/CALL RATIO**

put/call ratio is another tool used by contrary-opinion technicians. Put options (which give the holder the right to sell stock at a specified price for a given time period) are used as signals of a bearish attitude. Higher the put/call ratio, more pervasive the bearish attitude and hence this will serve as a bullish indicator for the contrarians.

### **FUTURES TRADERS BULLISH ON STOCK INDEX FUTURES**

The proportion of speculators in stock index futures who are bullish is also used as one of the tools by the contrarians.

### **FOLLOW THE SMART MONEY**

A set of indicators that indicate the behavior of smart, sophisticated investors. These indicators are constructed by some technical analysts to create some rules to follow them.

#### **Confidence Index**

It is the ratio of Barron's average yield on 10 top-grade corporate bonds to the yield on the DowJones average of 40 bonds. This ratio is always less than one as the yields on high-grade bonds always should be lower than those on a large cross section of bonds.

When this ratio is high, it is interpreted to indicate a bullish signal. This is because when investors are confident, they are expected to invest more in lower-quality bonds for the added yield. Because of this attitude of the investors, there will be a decline in the average yield for the large cross-section of bonds relative to the yield on high-grade bonds and hence the ratio is high. The opposite holds good when investors are pessimistic and hence the index will be low.

#### **T -Bill - Eurodollar Yield Spread**



This is another measure of investor confidence based on the spread between T-bill and Euro dollar rates. It is observed that during times of international crisis, this spread widens as money flows to the US T-bills increases causing a decline in the ratio. This would serve as a leading indicator of stock market trough which is expected to occur subsequently.

#### **Short Sales by Specialists**

Specialists trading on the exchange often engage themselves in short sales for market making purposes. They often exercise their discretion in this area when they feel strongly about future expected market changes. For technicians, a value below 30% of specialists would be minimizing their participation in short sales. When the ratio crosses 50%, then a bearish market is expected to prevail.

#### **Debit Balances in Brokerage Accounts (Margin Debt)**

When money is borrowed by the investors from their brokers, brokerage accounts show debit balances. These balances represent the attitude of investors who involve themselves in margin transactions. Therefore, any increase in debit balances would indicate a bullish sign. On the other hand, a decline in debit balances would indicate a bearish sign.

#### **OTHER MARKET ENVIRONMENT INDICATORS**

**Breadth of Market:** It measures the ratio of number of issues that have increased in price each day to the number of issues that have decreased in price. This is useful in explaining the cause of a change of direction in DJIA or the S&P 500 index.

**Short Interest:** It is the cumulative number of shares that have been sold short by investors and not covered. The short interest ratio is calculated by the technical analysts as a ratio of outstanding short interest to the average daily volume of trading on the exchange.

**Block Uptick-Downtick Ratio:** As nearly 50% of trade volume in NYSE is done by block trading by institutions, the exchange can determine the direction of price change accompanied by a particular block trade relative to the price of the prior transactions. If the block trade price is higher than the prior transactions, then it is known as uptick. On the other hand, if the block trade price is lower than that on the prior transactions, then it is known as downtick.

When the block trade is initiated by a buyer, then one can expect an uptick, if it is initiated by a seller, then one can expect a downtick. Uptick-downtick ratio, thus, would indicate institutional investor sentiment. If the ratio is around 0.7, then it indicates a bullish condition and if it is around 1.1, then it indicates a bearish sentiment.

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### **8. Identification of support and resistance levels is an important application of trend line. Enumerate the importance of support and resistance lines in technical analysis and also discuss the principles involved while using these for trend analysis.**

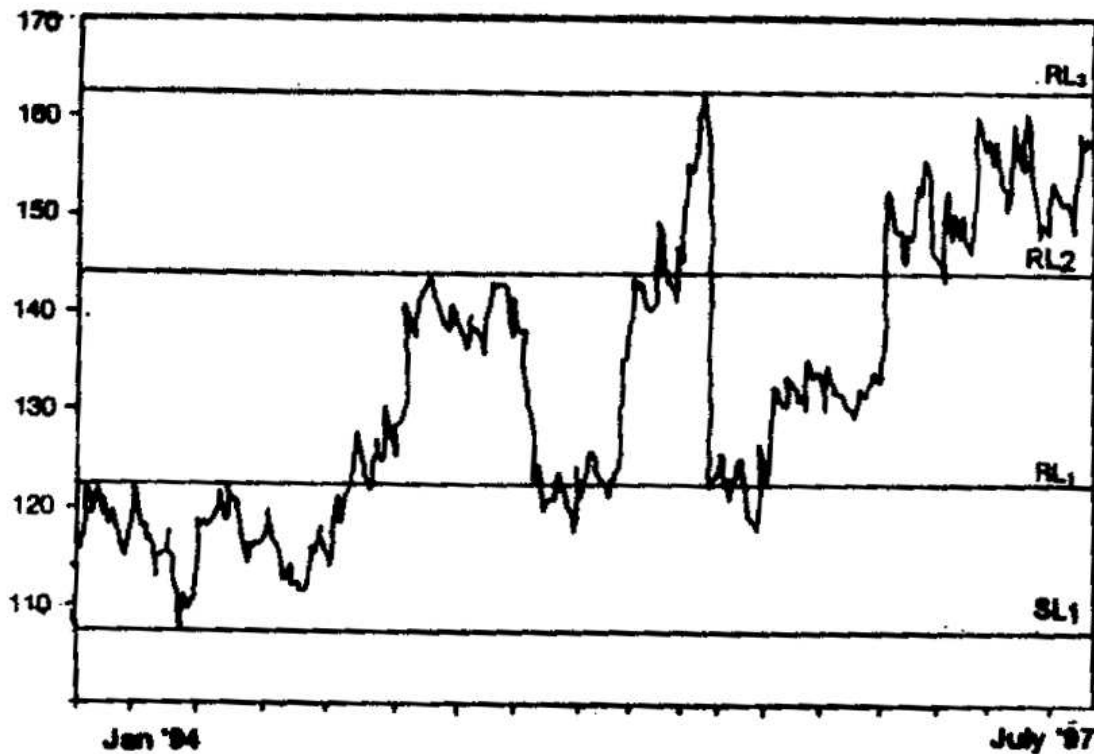
#### **Support and Resistance**

An important application of trend lines is in identification of support and resistance levels.

Resistance is defined by Edward and Magee as 'Selling, actual or potential, sufficient in volume to satisfy all bids and hence stop prices from going higher for a time period'. Support is defined as 'Buying, actual or potential, sufficient in volume to halt a downtrend in prices for an appreciable period'.

A support zone is formed when the demand supply balance tilts in favor of buyers, resulting in a concentration of demand. A resistance zone similarly represents a concentration of supply. The concepts of support and resistance can be illustrated with the help of an example. Consider the following figure which shows the price chart.

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The behavior of prices during January-May does not throw up any price pattern, but the range within which the prices are found to be fluctuating warrants attention. On almost 6 occasions, prices have climbed to the level of Rs.122, and returned. Prices can be observed to face resistance at this level, as every time they reach there, they fail to climb further, but fall back. A trendline drawn to represent this level is called a resistance line (designated RL1 in the figure). Similarly, prices have not fallen beyond a level of Rs.110, most of the times they returned from the resistance line. It can be said that a support level exists at which prices have shown a tendency to climb up again, rather than continue to fall. The maximum fall registered is at Rs.106, represents the level at which support has almost invariably occurred. Line SL1 represents this line of support.

Support and resistance lines are, therefore, trend lines drawn to indicate the ranges a trend can be expected to take, using the past behavior as a reference point. These lines throw up further interesting inferences. When the prices pierce the resistance level RL1, it is an indication that buyers have succeeded in breaking the resistance, and prices can be expected to climb up. The new high reached would represent a new level of resistance (represented as RL2). Prices now are found to fluctuate between the old RL1, and the new RL2. The point to be noted is that the old resistance line is the new support line, as price receive support at a level almost equal to RL1.

Similarly prices can be observed to reach a new resistance level RL3, and find support at the previous RL2.

The support and resistance levels are important tools in confirming a reversal, in forecasting the course of prices, and in making appropriate price moves. The following principles are to be applied while using support and resistance lines for trend analysis:

- i. Support and resistance lines are only approximations of the levels prices may be expected to 'obey'. They should therefore be drawn using judgment, and clues from the past price behavior.
- ii. Penetration of a support or resistance line, also confirmed by an underlying price pattern, is a fairly sure indication of a strong ensuing move in the same direction. New highs are reached after a resistance line is penetrated and new lows follow penetration of a support line.
- iii. Prices are said to remain in a 'congestion zone' as long as they fluctuate in narrow ranges within a support and resistance level. The direction of breakout from a congestion zone cannot be predicted in advance.
- iv. The higher the volume accompanying the confirmation of a support or resistance level, the more its significance.
- v. The speed and extent of the previous move determines the significance of a support or resistance level. Prices penetrate support (resistance) level generally after slowing down from a previous low (high) and hovering around a level for sometime.
- vi. Support and resistance levels repeat their effectiveness time and again, even if separated by many years.

**Q Sometimes the Price to sales ratio can even be a contrary indicator of a company's valuation. Elucidate. Also suggest some similar better tool for valuation.**

When analyzing companies, sometimes price-to-sales ratio is of little help in understanding how a company is really valued by the market. There are two main reasons against the Price to sales ratio for being a contrary indicator

**1. Not all sales dollars are created equal.**

Some sales come with a high degree of profitability, while some only bring pennies on the rupees invested. Let's take a real-world example of grocery store company versus software behemoth. Take a look at each company's margins:

| Company      | Grocery store | Software |
|--------------|---------------|----------|
| Gross Margin | 86.9%         | 24.4%    |
| Oper. Margin | 47.6%         | 4.8%     |
| Net Margin   | 41.0%         | 1.4%     |

It should be painfully obvious that every dollar in sales that Software company brings in is much more valuable (about 30x more valuable!) than every dollar in sales that Grocery store brings in. Comparing price to sales ratio on an apples-to-apples basis is not a good idea because the sales of two different companies mean entirely different things to the bottom line and, ultimately, to the cash flow-generating capability of each. In the end, Price to Sales Ratio figures would differ greatly. Any talk of sales figures without a concurrent talk of margins is useless.

**2. The Price to Sales Ratio ignores capital structure**

One of the peculiarities of the Price to Sales Ratio is that it actually favors companies with high levels of debt. Because it compares one number (market capitalization) that is dependent on a company's capital structure to another number (sales) that is not, it essentially ignores whether a company is funded with equity or debt. This is not a trivial distinction. For example. Assume below that we have three companies with exactly the same businesses. They each have identical future prospects and operating income, and the only difference is the capital structure and the amount of debt used to finance each.

| Details                       | Company A | Company B | Company C |
|-------------------------------|-----------|-----------|-----------|
| Sales                         | Rs.100    | Rs.100    | Rs.100    |
| Gross Profit                  | Rs.40     | Rs.40     | Rs.40     |
| Operating Income              | Rs.15     | Rs.15     | Rs.15     |
| Interest Expenses             | 0         | Rs.15     | Rs.40     |
| Pretax Income                 | Rs.15     | 0         | (Rs.25)   |
| Taxes                         | Rs.5      | 0         | (Rs.8)    |
| Net Income                    | Rs.10     | 9         | (Rs.17)   |
| Total Assets                  | Rs.200    | Rs.200    | Rs.200    |
| Net Debt                      | 0         | Rs.150    | Rs.400    |
| Assumed Market Capitalization | Rs.300    | Rs.150    | Rs.10     |
| Price to Sales Ratio          | 3.0       | 1.5       | 0.1       |

Even though all of the companies are in the same boat operationally, the Price to Sales Ratio shows that companies B and C are actually cheaper than company A. In fact, the Price to Sales Ratio points to company C as the cheapest of the bunch, even though it is the one that appears headed towards bankruptcy. Thus, this shows that higher amounts of debt actually tend to skew the Price to Sales Ratio lower, sometimes significantly.

A better tool to use is the so-called "enterprise value-to-sales" ratio, or EVSR. A company's enterprise value is the company's market capitalization plus debt minus cash. Think of enterprise value as the buyout price one would have to pay to buy all the stock, retire all the debt, and then use the leftover cash to offset the cost. By comparing enterprise value instead of market capitalization to sales, at least we can take a company's capital structure into consideration.

Finally, the Price to Sales Ratio is not only useless in many cases, but it can also sometimes be a contrary indicator of a company's valuation. This is why it is important to look at several ratios as a group to get a sense of a company's cash-flow generating capacity and the price the investors have to pay to get proportionate share of that cash flow.

**Q Technical Analysts observe moving average more for ‘crossovers’ than for the changes in direction and obtain more clear-out buy-sell signals than those obtainable from trendlines. With respect to this, discuss the principles followed by moving averages.**

Following are the principles followed by Moving Average Curve:

When the moving average rises above the price line, a reversal in bullish trend is signalled. This is based on the simple logic that as long as price at the end of a period is above the average that prevailed in the immediate past, prices are on an uptrend. The converse is true for confirming the end of a bear market. The price line in that case would crossover the moving average.

The price line moving average crossover has to be examined cautiously when the price line and moving average move in opposite directions before the crossover. The price line that falls below a rising moving average only indicates a secondary reaction and need not signal a trend reversal. Similarly, a price line that rises above a falling moving average is an indication to sell.

A moving average represents a smoothed trend and therefore, also acts as a support/resistance line. A declining price line often finds support at the moving average line and rallies without crossing the line. Similarly, a rally in a bear market meets resistance at the moving average, and turns down.

If the moving average is flat or has already begun to change direction, a crossover by the price line is a fairly reliable indicator of trend reversal.

The significance of a crossover signal depends, to a large extent, on the time span covered by a moving average. A moving average covering a longer time span is actually smoothing a long-term trend, and its crossover is more significant than a crossover of an average of shorter time span.

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**Q State some of the risk containment measures that have been put in place to render the secondary market, fair and efficient.**

A number of risk containment measures have been put in place to render the secondary market, fair and efficient.

- Screen based trading has brought efficiency and transparency. It has cut down the cost, time and risk involved. A large number of participants, irrespective of their location, now trade with one another anonymously and simultaneously providing equal access to every player.
- Dematerialization has saved from the risk of loss in transit or in custody, misplacement or mutilation, theft or destruction, bad delivery or delayed delivery, forgery or duplicity, and also from irritating headaches of intimation of change of address, watching the receipt of bonus or rights shares, etc.
- Settlement Cycle of T + 2 days has been so smooth and successful that it has received worldwide acclamation.
- The comprehensive risk management system now in place, which is continually monitored and upgraded, covers capital adequacy, margining, exposure and turnover limits, online position monitoring and automatic disablement.
- Central Counterparty in the form of clearing corporation, which provides the platform to its trading members to trade and ensures that the members meet their obligations.
- An index based market circuit breaker system is also operative to curb unhealthy volatility. These circuit breakers apply at three stages of the index movement, either way, at 10, 15 and 20 percent.
- The introduction of the derivatives in the market and the gradual enlargement of the basket of products comprising Index Options, Index Futures, Stock Options and Stock Futures, has enhanced the liquidity, efficacy of the market and also provided hedging opportunities, besides tempering volatility in margining.
- Central Listing Authority had helped in harmonizing the listing requirement across the various stock exchanges and centralizing the listing powers in one single authority.
- The corporate governance standard is a crucial factor for ensuring investors confidence. While the Company Law would take care of the basic requirement of the form of corporate governance structure, SEBI is concerned with the corporate governance.
- As a measure of regulatory dynamism, various guidelines concerning intermediaries, listed entities, and trade practices have been reviewed and suitably modified.

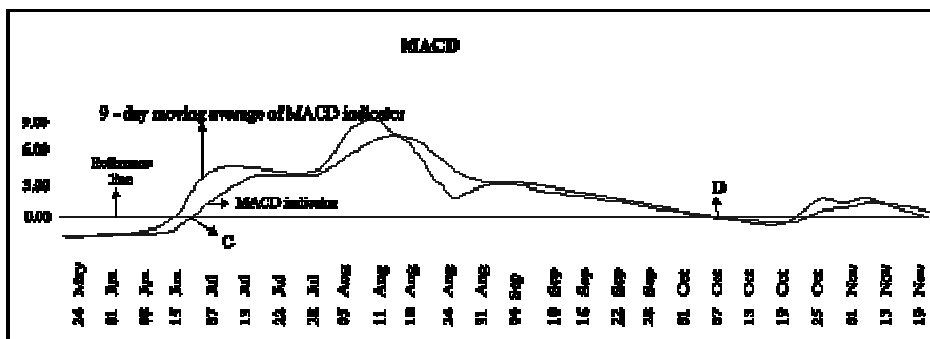
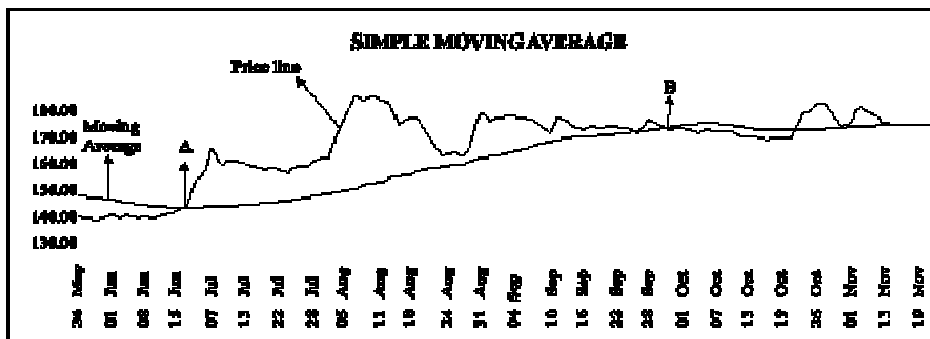
Several initiatives have been taken to improve the operational efficiency and transparency in equity market and to provide investors with the security issues of high quality and to enable entities to raise resources in cost effective manner.

**Q Comment on whether the stock should be bought, sold or held at points A, B, C, D, and E based on the share price charts.**

At point A, the price line rises above the moving average line, which is showing a slight down trend. It is an indication to sell. Around that time, the MACD indicator crosses the reference line from below (C), and it is an indication to buy.

At point B, the price line falls below the moving average line which is showing an uptrend. It can be considered a secondary reaction and a bounce back of prices should be expected and it is an indication to buy. In October, the MACD line crosses the reference line from above (D) and hence is an indication to sell.

**Technical Analysis Charts**



**Q Technical analysts always confirm whether the A-D lines has made the final advance by waiting for a downside trendline penetration or a moving average crossover. Breadth of the market is popularly studied using A-D lines. Other techniques are also used along with the A-D lines to measure breadth of the market. Describe briefly the popular methods of measuring the breadth of the market.**

Breadth of the market is popularly studied using A-D lines. Other techniques are also used along with the A-D lines by technical analysts. The four popular methods are

- i. Stocks in positive trends
- ii. Percentage of stocks over a moving average
- iii. Diffusion indexes
- iv. High-Low statistics

**i. Stocks in Positive Trends**

A stock which rallies after a decline to reach a new high is said to be in an uptrend; a stock that reacts to reach a new low is said to be in a downtrend. The percentage of stock in an uptrend to the total stock traded is computed and plotted on a graph. A rising market is expected to have an increasing percentage of uptrend stock. Reversal is signaled when stock in positive trend begin to diminish.

**ii. Percentage of Stock Over a Moving Average**

A specific moving average for a number of stocks is first computed, and the percentage of the number that is

above the average is ascertained. The percentage of stocks over a moving average increases in a bull market, and generally moves along with the positive trend index computed in (i) above. When the percentage of stocks over a moving average reaches an extreme of 90-100 percent or 10-15 percent, it indicates that a substantial proportion of the prevailing move has taken place and that reversal is imminent. When the percentage index reverses direction, the reversal in market trend is almost immediate.

iii. **Diffusion Index**

A diffusion index momentum index is computed by calculating the rate at which a certain group of stocks change price over a given period of time. It is generally calculated on either a wide number of stocks, or a number of industry indexes. Also called the momentum index, a rise in the index signals the onset of a bull market and vice versa.

iv. **High-Low Statistics**

Technical analysts also study the high-low statistics to confirm market trends. A rising market should be accompanied by a healthy number of net new highs. A graph of a net new highs can be plotted to be read along with a market index. If net new highs trace a series of declining peaks while the index continues to rise, a reversal is imminent. Similarly, a graph of net new lows can be expected to signal the end of a bear market, when it does not confirm the new trough reached by the market index. This is because, a declining number of stocks reaching new lows implies that larger number of stocks are resisting the downtrend in the market index, and thus signifies the end of a bear market.

Breadth of the market, thus, is an important indicator of the depth of the prevailing trend, and is of immense utility to the analyst in identifying trend reversals

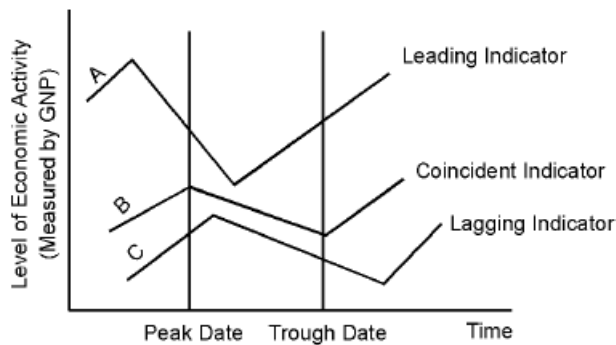
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**Q Forecasting economic scenarios is an integral part of the fundamental analysis process. What are the important techniques of forecasting economic scenarios? Discuss.**

The important forecasting techniques are:

a. **Leading Indicator approach**

The lead indicator approach attempts to forecast the general economic conditions by identifying economic indicators that turn ahead of the change in the general level of economic activity. Economic indicators are nothing but time series which tend to turn up or down in advance of or concurrent with, or after the economic upturn or downturn. From figure given below, we find that indicator A turns ahead of the peak and trough of the business cycle whereas indicators B and C turn in unison with or after the peak and trough of the cycle.



So, to forecast the change in the economic conditions, we will be obviously interested in leading indicators because they provide advance signals of the turning points in the economic activity.

While identifying a lead indicator for the purposes of forecasting, the analyst must ensure that the lead indicator fulfills the following criteria as closely as possible: (1) It should move smoothly from one period to another as it rises or falls and should turn sharply at its peaks and troughs. If a series zigzags during its upward or downward swings, it becomes difficult to know whether the 'zig' is a genuine turning point or a temporary reversal of trend. (2) An ideal lead indicator should always lead turning points of general business activity by the same number of months with no 'false' leads. (False leads are predictions of business turning points which do not materialize). (3) It should lead by enough time to permit the user to make necessary alterations in his plans, but do not lead by a long- time interval that will make him disbelieve the indicator. (4) The indicator should fit logically with the business cycle theory. The more logical it appears that a particular series will turn ahead of economic conditions, the more assured the user can be that its historical lead relationship will continue in the future.

Some of the leading economic indicators are the utilization of manufacturing capacity, residential construction, corporate profits, and of course the general level of stock prices. Since the movement in the general level of stock prices is what we are ultimately interested in forecasting, we should look for that

leading indicator which would act as a lead to the leading indicator under consideration.

The lead indicator approach is most valuable in suggesting the direction of change in economic activity. But it does not convey any information on the magnitude and duration of the change. The other important limitation of this approach is that the signals provided by the different lead indicators can be mixed. In other words, some of the leading series might signal a turn while the others might not, resulting in a serious problem of interpreting the same for the purpose of arriving at a forecast.

This limitation can of course be resolved by shortlisting only such lead indicator(s) that satisfy the criteria mentioned above. The diffusion index approach discussed in the next section partly attempts to resolve the problem of mixed signals.

#### **b. Diffusion Indices**

A diffusion index (as the name implies) is a measure of how widespread (diffused) a phenomenon is. We can set up a diffusion index for leading indicators by counting the number of indicators that rise during a particular period and expressing it as a proportion of the total number of lead indicators and more desirably in a percentage form. If five out of, say, ten leading indicators rise during a particular month, the diffusion index for that month will be 50 percent. If, in the next month, seven rise (not necessarily including all the five which rose in the previous month), the index for that month will be 70 percent. The user must interpret the diffusion index relative to the levels of the index in the past. Certainly a rise from 50% to 70% in the index is a stronger confirmation of a period of economic advance.

#### **c. Econometric Model Building Approach**

As far as short-term economic forecasting is concerned, an approach based on econometric methods has the advantage of providing a magnitude and direction to the dependent variable (unlike the lead indicator approach), say GNP. However, the user must understand that a precise estimate of the dependent variable (forecast value for GNP) obtained from the econometric model need not be an accurate one, because accuracy of the forecast will ultimately depend upon the quality of data input, the validity of the assumptions underlying the model, and above all upon the model builder's understanding of the underlying economic theory.

Further, as stated in the Indian context it must be noted that, an econometric model for forecasting GNP in a planned economy may not have much of a practical relevance because the planning priorities may change significantly, besides the likely changes in government regulation, fiscal policy, and the control mechanisms of money, credit, prices and wages. Econometric models can be meaningful for future projections if and only if the estimated co-efficients (like the intercept 'a' and slope 'b' in a linear regression model) are found to be acceptable in respect of their stability over time.

#### **d. GNP Model Building Approach**

The GNP model building approach forecasts GNP in the short-run by estimating the magnitudes of the various components constituting GNP. If GNP is defined as  $C + I + G + X - M$  where C, I, G, X and M stand for their standard definitions, then forecast for GNP under this approach is determined by estimating the likely values of C, I, G, X and M. To estimate these components, the forecaster relies extensively on the budget estimates of the Central and State Governments, the socio-economic surveys carried out by the Government and private agencies, and the field data collected for this purpose.

Once the forecaster estimates these major components, he adds them together to come up with his estimate of the GNP. He tests the forecast for internal consistency because of the interrelatedness of the GNP accounts.

For example, a given level of consumption implies a certain level of savings, which affects business investments which in turn affects production activities, and thus affects income and savings.

While these circular effects take place, other factors like interest rates and inflation will also be affected. So, the forecaster must ensure that his estimates for the different components take care of such interlinkage.

Apart from testing the forecast for internal consistency, the forecaster also examines it for external consistency by comparing it with forecasts obtained under other methods like the econometric model building approach.

The major advantage of this approach is its versatility. Since the GNP forecast is adjusted for all anticipated changes and tested for internal consistency, it is likely to be a reliable one. But the approach is data demanding and calls for a vast deal of judgment and ingenuity. The approach has been succinctly described by Lewis and Turner as 'an effort to build a view of the short-run business outlook that is comprehensive, that is as quantitatively precise as the state of our knowledge permits, that is internally consistent, that draws upon rather than sidesteps all the pertinent insights of modern aggregative economics but, at the same time, does not make a fetish of the theoretical rigor. Instead, the technique seeks to exploit any and all evidences of business prospects that may come to hand. It is particularly distinguished from pure econometric model building by its heavy use of data concerning the advance plans and commitments of certain spending groups, and it retains a sizeable place for judgment and free-hand adjustments'.