UNIT 7 COMPANY LEVEL ANALYSIS

Objectives

The objectives of this unit are to:

- Highlight the need for and importance of company analysis
- Explain the process of estimation of equity -ice
- Discuss and illustrate quantitative and qualitative methods to value equity
- Discuss methods of forecasting earnings per share

Structure

7.1 NEED FOR COMPANY ANALYSIS

In the previous unit, we have discussed the relevance of economy and industry analysis and how it can be conducted. In this Unit, we will discuss the company level analysis. In order to provide a proper perspective of this analysis, let us begin by discussing the way investor takes the investment decision given his goal of return maximization. For earning profits, investors apply a simple and common sense decision rule. That is,

- Buy the share at a low price, and
- Sell the share at a high price

The above decision rule is very simple to understand but difficult to apply in actual practice. Despite this, efforts are generally made to operationalize it by using proper formal and analytical framework. To begin with, the problems faced by the investor are:

How to find out whether the price of a company's share is high or low?

Which benchmark to use to compare the price of the share?

The first question becomes easier if some benchmark is agreed upon with which the prevailing market price can be compared. Fundamental analysis in fact helps the investor in this respect by providing a benchmark in terms of intrinsic value. This value is dependent upon economy, industry and company fundamentals. Out of these three, company level analysis provides a direct link between investor's action and his investment goal in operational terms. This is because an investor buys the equity share of company and not that of industry and economy. Industry and economy framework indeed provide him with proper background against which he buys the shares of a particular company. This setting is nevertheless very important, but for action to take place it is the company that provides investors actual key settings. A careful examination of the company with its quantitative and qualitative fundamentals is, therefore, very essential. As Fischer and Jordan have aptly put it, "A good economic analysis inform the investor about the propriety of a current stock purchase, regardless of the industry in which he might invest. If the economic outlook suggests purchase at this time, the economic analysis along with the industry analysis will aid the investor in selecting their proper industry in which to invest. Nonetheless, knowing when to invest and in which industry is not enough. It is also necessary to know which companies in which industries should be selected".

7 . 2   DIFFERENT MEASURES OF VALUE

A common valuation measure is **Book Value,** which is the networth of a company as shown hi the balance sheet. Book value can be expressed on per share basis and in such a case, the book value per share is equal to net worth divided by the number of shares outstanding. Book value per share of few actively traded companies is given in Table 7.1. The book value is derived based on certain accounting assumptions. An important assumption is related to valuation of assets. Assets are valued after deducting the depreciation value from the acquisition cost. Depreciation amount of an asset for a period is computed based on the initial estimated life of the machine. There is no guarantee that the amount provided as depreciation is equal to loss in the value of the asset and it may be either more or less than the actual loss in the value of the asset. The market price of a stock takes into account the market value of the asset. Nevertheless, book value is a starting point in any valuation exercise and unless there is a window-dressing in accounting, the intrinsic value of an asset is at least equal to the book value of the asset. Table 7.1 also shows the market value per share and in many cases, the market value is greater than book value.

Another measure close to book value is **liquidation value** per share. This represents the amount of money that could be realized by breaking the firm, selling its assets, repaying debt and then distributing remainder to the shareholders. If there is an active takeover market, the price of the stock should be at least equal to liquidation value. Otherwise, corporate raiders would find it profitable to acquire the firm and then take up liquidation.

Value of a firm can also be measured by computing the **replacement cost** of the asset less debt. Replacement cost can be measured if you could find out what is the current cost of putting up a similar plant. For many industries, the cost per unit of capacity (like cost of I million ton of cement plant) is available. If the market price is below to this replacement cost level, then firms intending to expand will find it easier to acquire the firm than putting up one more plant.

All the above measures fail to look into the earning capability of the firm by using the assets. It is quiet possible that firms can use the assets and earn superior return because of several other advantages or skills available within the firm. On the other hand, market value of the firm takes into account such future income arising out of the use of assets. The ratio of market price to replacement cost popularly called **Tobin's q,** after the Nobel Prize-winning economist James Tobin, is another popular value measure among the economists.

Table 7.1: Book Value, Market Price and P/B Ratio as on March 31, 20XX

Company Name	Book Value	Market Price	P/B Ratio	HPY(%)
Wipro	38.94	1334.25	34.26	-76%
Infosys Technologies	168.43	4082.90	24.24	-54%
Hindustan Lever	11.30	218.75	19.36	-91%
Nestle India	26.75	506.10	18.92	35%
Digital Global soft	36.39	416.10	11.43	-42%
Satyam Computer Services	21.7	233.90	10.78	-95%
Cipla	109.25	998.80	9.14	-11%
Britannia Industries	79.45	690.15	8.69	11%
Dr. Reddy'S Laboratories	154.72	1247.25	8.06	-23%
Castrol India	31.89	229.85	7.21	-25%
GlaxosmithklinePharmaceutical	60.99	427.40	7.01	-5%
Sun Pharmaceutical Inds.	81.04	541.20	6.68	-15%
H D F C Bank	34.66	230.00	6.64	-10%
Colgate-Palmolive	24.36	154.50	6.34	6%
ITC	132.14	814.40	6.16	11%
P&G	111.88	566.40	5.06	-3%
Dabur India	12.25	60.90	4.97	-93%
Hero Honda Motors	28.49	140.35	4.93	-86%
N I I T	160.00	716.25	4.48	-65%
Smithkline Beecham	82.53	369.40	4.48	-8%
Ranbaxy Laboratories	136.56	576.95	4.22	-18%
Asian Paints	63.32	246.20	3.89	-42%
Reliance Industries	122.44	390.90	3.19	24%
Reliance Petroleum	15.91	48.55	3.05	-20%
HDFC.	194.16	544.85	2.81	43%
I C I C I Bank	61.97	165.40	2.67	-36%
Asea Brown Boveri	91.48	237.60	2.60	11%
Novartis India	109.72	269.75	2.46	-70%
Associated Cement Cos.	64.91	129.80	2.00	-8%
Gujarat Ambuja Cements	99.52	154.10	1.55	-28%
Tata Tea	160.96	233.95	1.45	-39%
Larsen & Toubro	155.10	221.30	1.43	-23%
Hindalco Industries	554.55	771.45	1.39	5%
Zee Telefilms	97.75	121.60	1.24	-88%
Indian Hotels Co.	217.73	254.70	1.17	5%
B S E S	176.22	187.85	1.07	-21%
MTNL	125.98	132.30	1.05	-44%
Tata Iron & Steel Co.	125.76	122.35	0.97	6%
Bharat Heavy Electricals	147.60	142.00	0.96	14%
Tata Power	109.14	99.15	0.91	47%
Hindustan Petroleum	182.58	160.60	0.88	22%
1 C I C I	109.08	87.95	0.81	-36%.
State Bank Of India	250.35	200.25	0.80	0%
Grasim Industries	317.20	249.10	0.79	-18%
Bajaj Auto	331.62	257.65	0.78	-33%
Mahindra & Mahindra	190.75	120.15	0.63	-63%
Oriental Bank Of Commerce	82.25	39.95	0.49	9%
TELCO	137.64	65.05	0.47	-52%
Indian Petrochemicals Corpn.	127.24	54.05	0.42	-11%
Tata Chemicals	96.10	38.05	0.40	-28%

Though the above measures give a fair estimation on the value of the stock, it is necessary to take into account the future cash flows for a better estimate of the firm's value as a going concern. We will examine a few models used in valuation that takes into the future value.

7.3 HOLDING PERIOD YIELD

Before attempting to discuss the approach that can be adopted for company level analysis, let us be clear about the objective of investor and how it can be quantified?

It is to reiterate the proposition that an investor looks for increasing his returns from the investment. These returns are composed of capital gains and stream of income in the form of dividends. Assuming that he wanted to hold equity shares for a period of one year only (known as holding period), i.e, he sells it at the end of the year, the total returns received by him would equal to capital gains plus dividends received at the end of the year, i.e.

$$R_t = (P_t - P_{t-1}) + D_t$$

Where P_t = Price of the share at the end of the year

P_{t-1} = Price of the share at the beginning of the year

D_t = Dividend received at the end of the year.

R_t = Return for the holding period, t.

In order to calculate the return received by him on his original investment (i.e. purchase price), total returns should be divided by P_{t-1}. These are expressed in percentage terms and known as holding period yield (HPY). Thus,

$$HPY(\%) = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}} \times 100$$

Table 7.1 also gives the holding period yield for NSE-50 Index stocks for the year 20XX-XI and you can observe that HYP is negative in many cases. Investors would not invest in stocks to earn negative return and hence the HPY computation has to be prospective to give meaningful input in valuation. For instance, the buyer of stocks in April 20XX would have estimated positive HPY for the stocks. In actual practice, however, the investor would know the beginning price of the share (called purchase price) as this is the price he or she has paid to buy the shares but the price at the end of the year (i.e., selling price) as well as dividend income to be received would have to be estimated. This is where the problem lies. How to estimate the future price of the share as well as dividends? is the main challenge. Time series data relating to dividends paid by companies provide us useful clues in estimating the dividends likely to be declared by companies. There is, it seems, a stable dividend policy followed by most firms in general. Thus, an investor would be able to estimate dividend receipts at the end of the year with reasonable degree of accuracy under normal circumstances. It has been found that company management is very conservative in increasing the amount of dividend paid to shareholders. Management does not increase the dividend unless this increase is sustainable in the long run. But the opposite is true in case of a dividend cut. They seem to be liberal in case dividend cut is to be made. This is to avoid further cuts if need arises. Amount of dividend, in actual practice, does not form a large part of the total returns of the investor. This is true particularly in many profitable companies. Nevertheless, it is an important constituent as indicated above.

Estimation of future price of the share that contributes a major portion in the total returns of the investor is much more problematic and is discussed in detail in the following section. In order to estimate future price of share, you may adopt two approaches, namely, Quantitative analysis and Qualitative analysis. Let us elaborate each of the two approaches.

7.4 QUANTITATIVE ANALYSIS

This approach helps us to provide a measure of future value of equity share based on quantitative factors. The two method commonly used under this approach are:

* Dividend discounted method, and
* Price-earnings ratio method

7.4.1 Dividend Discounted Method

The dividend discount method is based on the premise that the value of an investment is the present value of its future cash dividends. The present value (PV) is calculated by discounting the future cash dividend at cost of equity. The formula, thus, is

$$PV = \frac{D_1}{(1 + K)} + \frac{D_2}{(1 + K)^2} + ... + \frac{D_n}{(1 + K)^n}$$

If the dividend grows at a constant rate and the term "n" approaches infinity, then the above equation can be rewritten as under:

$$PV = \frac{D_1}{k\text{-}g}$$

Where,   k = discount rate or cost of equity

g = growth rate of dividend

D1 = expected dividend

Example: Varun Shipping has declared a dividend of 15% for the year ending March 2002. If the dividend will show a growth rate of 10% and cost of equity is 20%, what is the value of the stock as of March 2002?

Expected Dividend for the year 2003:	15 x (1+10%)	=16.5%
Expected Dividend per share (Face Value Rs. 10)		= Rs. 1.65
Growth Rate of Dividend		= 10% or 0.10
Cost of Equity		= 20% or 0.20
Value as per constant DDM		= 1.65/(0.20-0.10)
		= Rs. 16.50

The price of the stock as on March 31, 2002 was Rs. 12.35 against its value of Rs. 16.50. Hence, one can say that the stock was underpriced provided the assumptions on dividend growth rate and cost of equity are correct.

Dividend discount model assumes that the growth rate of future dividend is mainly arising out of retained earnings. That is if the firm grows because of retained earnings, it will have additional earnings, which in turn leads to higher dividend. This is basic assumption of constant dividend growth model. If the dividend growth is fueled by other reasons like cost reduction or increase in productivity or increase in market price, etc., the model may not reflect the cor'ect value. Another reason for the failure of the model is when the growth rate is more than discounting rate.

Though it looks that the value of shares can be increased by increasing dividend, it may not have the desired impact since an increase in payout will reduce the growth rate arising out of retained earning and thus negatively affect the value. In fact, the growth rate of dividend under constant growth model is equal to Return on Investment (ROI) times the ratio of retained earnings to net profit. For example, if the ROI of the company is 20% and the company retains 60% of the profit earned (i.e., the payout ratio is 40%), the dividend growth rate is expected to be 12%. If the company increases the dividend by paying 60% of its earnings, then the growth rate will be 8% (i.e. 20% multiplied by 40% of retained earnings). Thus any increase in the numerator of the valuation equation will be offset by an increase in the value of denominator and one can't expect the value to increase because of a mere increase in dividend rate or dividend payout ratio. Of course one has to look into cost of equity also. If cost of equity is equal to ROI, then changes in payout or retained earnings ratio will have no impact on the price. On the other hand, if the cost of equity is less than ROI, then an increase in payout ratio will adversely affect the value. If the cost of equity is higher than ROI, then value is positively affected if there is an increase in payout ratio. In Table 7.2, the dividend, earnings per share, payout ratio, growth of dividend, value as determined by the constant growth DDM and market price of the stock of select companies are given. For the purpose of maintaining simplicity, the cost of capital is assumed at 20%.

It may give you an idea about the extent of variation one can get between the values based on DDM and current market price and such variation can be either attributed to under or over pricing or absence of assumption of constant growth rate. You may note that market price as on March 31, 2001 is considerably higher than the value determined by the dividend discount model except in Tata chemicals, where the actual market price is marginally lower than the value computed under DDM.

Table 7.2: Comparison of Value under DDM and Actual Market Price

Company Name	EPS	DPS	Dividend Growth	Average Payout	Price DDM	MP (31/03/2001)	Variatio
ABB	13.04	5.0	7%	40%	42.24	237.60	462%
Asian Paints	17.02	7.0	10%	47%	80.50	246.20	206%
ACC	-3.41	2.0	4%	55%	12.70	129.80	922%
B S E S	22.09	4.0	7%	23%	33.22	187.85-	465%
Bajaj Auto	49.48	8.0	13%	23%	139.13	257.65	85%
BHEL	6.9	3.0	9%	15%	29.66	142.00	379%
Britannia	23.66	550	9%	35%	55.44	690.15	1145%
Castrol	10.88	7.5	9%	73%	78.02	229.85	195%
Cipla	28.87	4.5	19%	13%	791.89	998.80	26%
Colgate-Palmolive	438	825	0%	101%	40.65	154.50	280%
Dabur India	2.6	1.0	10%	30%	11.41	60.90	434%
Dr. Reddy' S	31.17	4.0	11%	18%	49.89	1247.25	2400%
Glaxosmithkline	11.	5.0	13%	54%	79.62	427.40	437%
Grasim	29.09	8.0	8%	27%	71.28	249.10	249%
GA Cement	25.	4.0	9%	32%	39.99	154.10	285%
Hero Honda	12.67	3.0	22%	21%	-153.47	14035	-191%
Hindalco	89.86	12.00	15%	10%	259.70	771.45	197°/8
Hindustan Lever	6.0	3.5	9%	66%	33.99	218.75	544%
HPCL	3035	10.00	11%	24%	117.11	160.60	37%
HDFC	37.78	1230	8%	37%	111.42	544.85	389%
I C I C I	15.13	550	5%	51%	3934	87.95	124%
I T C	38.88	10.00	18%	26%	497.76	814.40	64%
Indian Hotels	22.01	10.00	11%	34%	12131	254.70	110%
IPCL	9.0	3.0	7%	40%	2427	54.05	123%
Infosys	81.71	10.00	27%	12%	-170.67	4082.90	-2492%
L&T	8.8	630	4%	43%	41.68	22130	431%
MTNL	3134	450	10%	17%	49.81	13230	166%
M&M	14.96	550	8%	32%	51.63	120.15	133%
	60.92	430	25%	14%	-117.52	71625	-709%
Nestle India	123	14.00	2%	91%	7829	506.10	546%
Novartis India	17.18	15.00	10%	49%	16930	269.75	59%
Oriental Bank	11.23	350	6%	31%	25.56	39.95	56%
Procter & Gamble	38.99	7.5	7%	59%	60.71	566.40	833%
Ranbaxy	15.58	750	7%	39%	63.48	576.95	809%
Reliance Industries	24.11	425	8%	22%	37.89	390.90	932%
Satyam Computer	14.81	0.8	20%	21%	202.49	233.90	16%
SmithklineBeecham	24.68	6.3	24%	34%	-191.70	369.40	-293%
State Bank Of India	41.97	5.0	6%.	17%	36.81	20025	444%
Tata Chemicals	132	5.0	7%	55%	41.34	38.05	-8%
Tata Iron & Steel	14.43	5.0	4%	43%	33.48	122.35	265%
Tata Power Co.	2035	5.0	10%	27%	53.57	99.15	85%
Tata Tea	19.74	9.0	8%	54%	80.29	233.95	191%
Wipro	23.12	0.50	16%	6%	16.13	1334.25	8173%
Zee Telefilms	2.7	0.55	14%	25%	10.34	121.60	1077%

Note: Negative value in Price under DDM is on account of growth rate of dividend being more than assumed cost of capital of 20%

Growth rate of dividend is based on the average R01 of last five years times 1-payout ratio of last five years time.

On the basis of the above model, the following inferences can be drawn:

1. If the return on investment is equal to discounting rate, changes in payout ratio fail to have an impact on the value of the firm.

2. If the return on investment is greater than discounting rate, then value is positively affected if the company cuts the payout ratio.

3. If the return on investment is less than discounting rate, then value is positively affected if the company increases the payout ratio.

While applying this approach, one has to be careful about using the discount rate, K.

A higher value of discount rate would unnecessarily reduce the value of an equity while a lower value would unreasonably increase it, that will have implications to invest/ disinvest the shares. A discount rate is based on the risk free rate and risk premium. That is,

Discount Rate $=$ Risk Free Rate + Risk Premium

$\qquad$ K $\qquad = \qquad R_f + R_P$

Thus, higher the risk free interest rate with R_p remaining the same would increase the discount rate, which in turn would decrease the value of the equity. In the same way, higher risk premium with R_f remaining the same would increase the overall discount rat and thus decrease the value of the equity. The risk premium is computed by applying cap 1 asset pricing model, which we will discuss in Unit 12, You might have briefly covered this topic of computing cost of equity or cost of capital in your basic finance course.

One of the critical assumption in the above model is dividend shows a constant growth. In reality some companies like software companies in India may show a superior return but it may not be sustainable in the long run. For instance, if you expect that dividend to show a growth rate of 40% during the next 5 years and there after it will stabilize around 10%, then you can use DDM with a slight modification. This model is called multi-period dividend discount model. Under this model, it is first necessary to compute the dividend receivable upto sixth year. The first five year dividends are discounted to present value. Dividend received from sixth year to infinity can be used to value the stock at the end of fifth year using constant DDM. The value of the stock at the end of fifth year can be discounted further to get the present value of the stock today and added with the discounted value of first five years.

A numerical example will be useful. Suppose the expected dividend from a software company for the next year is Rs. 10 per share. It is expected to show a growth rate of 40% in the next five years. That is dividend for year 2 to year 5 will be Rs.14, Rs. 9.6, Rs. 27.44, and Rs.38.42 respectively. Thereafter the dividend is expected to show a growth rate of 10% and it means the dividend for the sixth year will be Rs. 42.26. The present value of first five-year dividends discounted at 20% is equal to Rs. 58.07. The value of the stock at the end of fifth year is Rs, 422.58. The present value of Rs. 422.58 is Rs.169.82. Together, the value of the firm is Rs. 227.89.

Year	Dividend Amount (Rs)	PV of Dividend (Rs.)	Rs. P
1	10.00	8.33	
2	14.00	9.72	
3	19.60	11.34	
4	27.44	13.23	
5	38.42	15.44	
PV of first 5 year dividend			58.07
6	42.26		
Value of share at the end of fifth year		422.58	
PV of value of share			169.82
Total value of share			227.89

7.4.2 Price-Earnings Approach

According to this method, the future price of an equity is calculated by multiplying the P/E ratio by the expected EPS. Thus,

$$P = EPS \times P/E \text{ ratio}$$

The P/E ratio or multiple is an important ratio frequently used by analyst in determining the value of a share. It is frequently reported in the financial press and widely quoted in the investment community. In India too, you could verify its popularity by looking at various financial magazines/newspapers. The P/E ratio essentially reflects the amount that the shareholders are willing to pay for every Rupee of earnings. As such it should reflect the risk associated with the earnings. For instance, if the P/E ratio is 5 for a company and 10 for another company, then investors perceive that risk associated with the earnings of first company is relatively higher than risk associated with the earnings of second company. That is the reason, if you examine the P/E of firms in the market, you will observe that P/E of multinational companies are much higher than the Indian firms. From the Market Price and EPS values given in Table 7.2, you can compute the P/E ratio of sample companies and compare the results. You can also examine the correlation between P/E and volatility in earnings to get a broad idea why investors give more P/E for some companies.

The inverse of P/E is equal to capitalization rate. For instance, if the P/E is 5, it means that the market is willing to capitalize the earnings by 20%. As in DDM, the P/E model also fails to consider the future potential of earnings of the company since growth rate of earnings is not deducted from the capitalization rate to get the value of the firm. For instance, in the above example, we find that the EPS is discounted at 20% to get the value without considering any growth rate in the earnings. If the EPS is expected to grow at 5% in the future, the discounting rate should be 15% but there is no provision for such adjustment under the P/E model.

This approach seems to be quite straight and simple. There are, however, important problems with respect to the calculation of both P/E ratio and EPS. Pertinent questions often asked are:

• How to calculate the P/E ratio?

• What is the normal P/E ratio?

• What determines P/E ratio?

• How to relate company P/E ratio to market P/E ratio?

The problems often confronted in calculating this ratio are: which of the earnings-past, present or future to be taken into account in the denominator of this ratio? Like wise, which price should be put in the numerator of this ratio? These questions need to be answered while using this method.

You will appreciate that the usefulness of the above model lies in understanding the various factors that determine P/E ratio. P/E ratio is broadly determined by:

• Dividend pay out

• Growth

• Risk free rate

• Business risk

• Financial risk

Thus, other things remaining the same,

1 Higher would be the P/E ratio, if higher is the growth rate or dividend payout or both.

2 Lower would be P/E ratio, if higher is

a) Risk free rate,

b) Business risk,

c) Financial risk.

The foregoing presentation helps us provide a quantitative measure of the value of an equity share. However, there still remains the problem of estimating earning per share, which has been used in both the methods discussed above. This is a key number, which is being quoted, reported and used most often by company management, investors, analysts, financial press, etc. It is this number every body is attempting to forecast. The starting point to forecast earnings per share, however, is to understand the chemistry of earnings as described in the previous unit. We shall describe various approaches to forecast earnings per share in the following section:

Activity -1

I.   you have the following information:

Expected Earnings per share	: Rs. 10	Current Payout Ratio : 40%
Expected Dividend per share	: Rs. 4	Return on Investments (ROI) : 20%
Cost of Equity	: 20%	
Growth rate of dividend	: 12% [ROl (20%) x Retained Earnings (60%*)]	

Value per share

(based on constant DDM)   :   Rs. 50

(a)   Using the DDM equation given above and assuming a R0I of 20%, find the equity value for the following combinations of payout ratio and cost of capital.

Cost of Capital	Payout Ratio		
	20%	40%	60%
16%			
20%		Rs. 50*	
24%			

* This value was already computed. Fill up the remaining cells.

(b)   Briefly write your understanding on the impact of changes in payout ratio and cost of capital on the value of stock.

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II. A) Define Company Analysis

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    B) A Compare and contrast 'Dividend Discounted Method' and the 'P/E Ratio method' of estimating price of an equity share.

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7.5   FORECASTING EARNINGS PER SHARE

Earnings is the most important number in valuing the stock. The most important and the principle source of getting information about the earnings of the company is its financial statements. Out of the two statements, namely, Balance Sheet and Income Statement, it is the income statement that is more often used in order to assess the future state of the firm. The income statement of the past few years shows the kind of growth that the company is witnessing on sales and earnings. A comparison of income statement of the company vis-à-vis income statement of the industry shows the market share of the firm. While the historical data culled out from the income statement is useful for estimating the earnings, one has to look into the current and future prospects. For instance, quarterly information will be extremely useful in this context. In addition, analysts can develop techniques linking company's fortune with a few other economic variables. Now-a-days, it is possible to get investment analysts expected information and they are published in several web sites and newspaper.

There are various methods employed to assess the future outlook of the revenue, expenses and earnings of the firm given the economic and industry outlook. These methods can be broadly classified into two categories, namely, traditional and modern. Under the traditional approach, the forecaster obtains the estimate of single value of the variable. While in the case of modem approach, he gets the range of values with the probability of each occurrence. Let us discuss these two approaches in detail.

7.6   TRADITIONAL METHODS OF FORECASTING EPS

Under the traditional approach the following methods of forecasting are adopted:

- ROI approach
- Market share approach
- Independent estimates approach

Before starting the discussion on the forecasting techniques, it will not be out of place to briefly mention the way the earnings per share is measured from the financial statements. This will provide us an understanding of its changes. Broadly, changes in earnings are affected by operating and financing decisions. Both these decisions are, however, interdependent. But attempts are generally made to separate the two decisions so that the effect of each is studied separately. Given below is the format which analysts use to calculate the earnings per share.

Income Statement for the year ended.........................
- (1)   Sales Revenue
- (2)   **Less:** Operating Expenses
- (3)   Earnings Before Interest and Tax (EBIT)
- (4)   **Less:** Interest Expenses
- (5)   Earnings Before Tax (EBT)
- (6)   **Less:** Taxes
- (7)   Earnings After Tax (EAT)
- (8)   Number of Shares Outstanding
- (9)   EPS = EAT/Number of Shares Outstanding

Let us now explain the R01 approach to forecast earnings per share.

7.6.1   ROI Approach

Under this approach, attempts are made to relate the productivity of assets with the earnings. That is, returns earned on the total investment (assets) are calculated and estimates regarding earning per share are made. Simply stated,

Return on Assets = EBIT/Assets

Return on assets (ROA) is a function of the two important variables viz., turnover of assets, and margin of profit. In other words,

Return on Assets = Assets Turnover x Profit Margin

where,   Asset Turnover   =   Sales/Assets

Profit Margin   =   EBIT/Sales

Therefore, ROA   = (Sales/Assets) x (EBIT/Sales),

ROA is thus a function of (1) number of times the asset base is utilised and converted into sales (asset turnover) and (2) profits earned on the sales (Profit margin). This is a simple but crucial relationship. The above two equations can be further decomposed. For instance, the asset turnover ratio can be decomposed further to fixed asset turnover and current assets turnover. Profit margin can be further decomposed to expenses ratio. Such kind of decomposing helps the analysts to forecast the earning more accurately. For instance, asset turnover ratio of the firm can be forecasted if we are able to get some idea about the growth rate of the industry. Profit margin can be forecasted by looking into the cost structure and the impact of recent changes in the prices of critical raw materials. Once an analyst or investor forecast the individual components of ratio, it is possible to forecast the ROA. ROA will be useful to forecast the EBIT. EBIT requires a minor adjustment before getting earnings per share. The adjustment is on account of debt used by the firms.

Leverage is the use of borrowed funds in the enterprise with a fixed cost. The more is the use of such funds, the higher is said to be the leverage. As borrowed funds are of a fixed rate/cost and if the firm is earning profits, it is profitable to use more of borrowed funds. However, there is limit beyond which use of borrowed funds can increase the risk associated with the earnings per share and in certain cases may also reduce the earnings per share. It is often said that as borrowed funds increase in relation to equity funds in the total financing mix, borrowing costs would not only increase; but increase more rapidly than the amounts borrowed. This happens because the suppliers of funds now perceive the business more risky when borrowed funds are utilised beyond a certain point. The relationship between Return On Equity (ROE), ROA and debt can be explained as follows:

Rate of Return on Equity = R + (R-I)L/E

Where,   R = Return on Assets

I = Effective interest rate

L/E = Total outside liabilities/equity

If we multiply the above equation with equity capital, we can find out the earnings before taxes.

Thus, EBT = (R+(R-I)L/E)E, and

As forecasting of earnings is the central theme in the company level analysis, it requires an understanding of the earnings formation process. The ROI approach provides a framework for analysing the effects and interaction between the return a firm earns on its assets and the manner it is financed. Once this return generating power is understood by the analyst, he can forecast the key variables in the model and substitute the forecasted values into the model and forecast Earnings After Tax (EAT).

Based on the chemistry of earnings, the analyst can further use the following equations to calculate the earnings per share:

$$EPS = \frac{[(1-T)\{R+(R-I)L/E\}E]}{\text{Number of shares outstanding}}$$

The above model is quite simple but its importance will be realised if we keep the variables in the functional forms as shown below:

<div style="border:1px solid">

Earnings per share and its changes are a function of:

1. Utilisation of asset base

2. Productivity of sales (Profit Margin)

3. Effective cost of borrowed funds (I) = $\dfrac{\text{Interest expenses}}{\text{Total outside liabilities}}$
    (effective rate of interest)

4. Debt equity ratio (L/E) = Total outside liabilites/equity

5. Equity base (E)

6. Effective tax rate (T) = Tax expenses / EBT

7. Return on assets = EBIT/Assets

</div>

The model can be used to forecast earnings in the future holding period. For this purpose, the analyst has to collect the information relating to the following variables:

1	Net sales	6	Taxes
2	Other Incomes	7	EAT
3	Cost of Sales	8	Average Shares Outstanding
4	EBIT	*9*	Earnings per share (EPS)
5	Interest Expenses	10	Dividend per share (DPS)

Other relevant information with regard to the financial position is as follows:

1. Total Assets
2. Current Debt
3. Long term Debt
4. Equity shares
5. Total Debt and Equity

After collecting the above information, it can be summarised and the following key variables can be calculated and arranged in the tabular form for the purpose of analysis. The following table gives the picture relating to the information as required for the application of this model:

Summary Table

1	Earning per Share	
2	Return on Assets	
3	Profit Margin	
4	Asset Turnover	
5	Effective Interest Rate	
6	Total Equity/Outside Liabilities	
7	Number of Shares Outstanding	
8	Effective Rate of Interest	
9	Earning per Share	
10	Dividend per Share	
11	Retention Rate (1-10)	
12	Cost of Equity	
13	Growth rate of Dividend (2) x (11 }	
14	Value per share	

The intrinsic value of the share can be computed with the help of Dividend Discount Model (DDM) explained earlier by using the key variables.

7.6.2 Market Share Approach

This approach emanates from the industry analysis. Once the estimate about the future prospects of the industry is completed, the analyst would then look into the firms, which are the leaders and pacesetters in the industry and would then find out the market share of the firm to be analysed. The following steps can be adopted to implement this method:

1. Estimate the industry's total sales

2. Estimate the firm's share in the total sales in industry i.e. market share

3. Estimate the profit margin

4. Multiply sales by profit margin to get total earnings

5. Divide earnings by number of shares outstanding to get EPS.

6. Multiply EPS by P/E ratio.

In order to estimate the profit margin under this approach, the analyst has to understand the mark up and behaviour of cost and prices during the relevant range of activity. This calls for having an understanding of profit-volume relationship of the firm. The analyst should look into various component of costs like:

1. Fixed and variable cost (or operating leverage), and

2. The level of sales volume the firm is likely to attain during the forecast period.

7.6.3 Independent Estimates Approach

Under this approach, each and every item of revenue and expense is estimated separately and summed up to arrive at the future EPS. All the three approaches are traditionally utilised by security analysts. However, these are not mutually exclusive approaches. But one important and common limitation of these approaches is that they indicate point estimate of EPS and HPY and therefore, attach 100% probability of outcome.

7.7   MODERN METHODS OF FORECASTING EPS

Under modern approaches to forecasting earnings of a company, statistical techniques ate used. The following techniques are generally included in this category:

*   Use of regression and correlation analyses

*   Use of trend analysis

*   Decision tree analysis

Let us briefly discuss each of these.

7.7.1   Regression and Correlation Analyses

In order to find out the interrelationships of relevant variables, the techniques of regression and correlation analyses are used. When the inter-relationship covers two variables, simple regression is used and for more than two variables, multiple regression technique is used. Using this approach, security analysts may find out the inter-relationship between the variables belonging to the economy, industry and the company. For instance, if the analyst believes that the sales of the firm depends on GDP growth rate, monsoon, and population growth rate, then it is possible to set a relationship between sales and other independent variables by collecting the data pertaining to sales and other variables for the last few years, say20 years. Once the data is ready, a regression model can be set out to find the relationship and can be used to predict the sales. Major advantages in its application relate to deriving the forecasted value as well as testing the reliability of the estimates.

7.7.2   Trend Analysis

While using this technique, the relationship of only one variable is tested over time using the regression technique. In a way, it is the simple regression technique where the inter-relationship of a particular variable is tested vis-à-vis time. That is why the name trend analysis. It is quite useful to understand the historical behaviour of the variable for the purpose of the security analysis.

7.7.3   Decision Tree Analysis

The above two methods are considered superior to the traditional methods employed to forecast the value of earnings per share. However, an important limitation remains. Both these methods provide only point estimate of the forecast value. In order to improve decision making process, information relating to the probability of occurrence of the forecast value is quite useful. Thus a range of values of the variable with the probabilities of occurrence of each value will go a long way to improve decision by the investor. To overcome these limitations, decision tree and simulation techniques are used. Under the decision tree analysis the decision is assumed to be taken sequentially with probability of each sequence. Thus, in order to find out the probability of the final outcome, given various sequential decisions along with probabilities, the probabilities of each sequence is to be multiplied and summed up. In practice, whenever security analyst attempts to use decision tree analysis in conducting analysis of the securities, he starts with estimating the sales. The application of the decision tree analysis is illustrated below by taking a simple example.

1. Sales(Rs. Lakhs)   Probability

    10.0   .3

    12.0   .5

    11.0   .2

2. Expenses   Probability

    6.0   .6

    7.0   .4

3. P/E ratio   Probability

    10   .4

    20   .3

    25   .3

4. Number of shares outstanding is one lakh.

A)   Estimation of EPS by Decision Tree Approach

Probability	Sales (Rs. In	Probability	Expenses (Rs. Lakhs)		Estimated Earnings (Rs. Lakhs)	Equity Shares (Nos)	Estimated EPS (Rs.)
0.30	10	0.60	6	3.0-3.6 =	0.6 ÷	1 =	-0.60
		0.40	8	3.0-3.2 =	-0.2 ÷	1 =	-0.20
0.50	12	0.60	6	6.0-3.6 =	+2.4 ÷	1 =	+2.40
		0.40	8	6.0-3.2 =	+2.8 ÷	1 =	+2.80
0.20	11	0.60	6	2.2-3.6 =	-1.4 ÷	1 =	-1.40
		0.40	8	2.2-3.2 =	-1.0 ÷	1 =	-1.00
			Total				2.00

B) Estimation of Share Price

Estimated EPS(Rs.)	P/E Ratio	Probability		Estimated Share Price (Rs.)
	10	0.40	$2 \times 10 \times 0.40 =$	8
2	20	0.30	$2 \times 20 \times 0.30 =$	12
	25	030	$2 \times 25 \times 0.30 =$	15
		Total		35

The above approach provide us the information with a range of values with the probabilities of their occurrence instead of a point estimate. This is quite helpful in forming expectations with regard to the likelihood of the events to improve the decision making process.

Activity-2

a)   List out traditional methods of forecasting EPS.

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………………………………………………………………………………………
………………………………………………………………………………………

b)   Compare and contrast traditional method of forecasting EPS with modern methods.

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7.8   QUALITATIVE ANALYSIS

As mentioned earlier, the quantitative approach helps us to provide a quantitative measure of the value of an equity. Various methods/models discussed above are quite useful. But caution is required to base one's decision only on the figure derived by such analysis. Analyst is also required to bear in mind qualitative/subjective factors. An alert analyst would be able to gather such information from the following sources:

1.   Company's financial statements

2.   Financial Press, magazines etc.

3.   Company's officials

This information may relate to the following factors:

i)   Availability of infrastructure

ii)   Inventory-size, value, risk

iii)   Order book position

iv)   Product risk

v)   Marketing and distribution

vi)   Components of cost-fixed and variable

vii)   Availability of raw material inputs

viii)   Cost of inputs

ix)   Quality of personnel

x)   Quality of management

xi)   Future plans

With the qualitative factors in mind, an investor/analyst can judge whether the quantitatively derived measure of value of an equity is reasonable or not and accordingly take informed risk while taking the decision to invest or disinvest shares of a company.

Of all the qualitative factors, quality of management is most important. As one successful investor quipped `I don't invest in products; I invest in management'; What he meant was that more than considering product, he analyses management of the company. Needless to say, the assessment of quality and competence of management is perhaps most difficult. J.C. Francis (1983) suggested a list of forty four questions to be probed and answered in order to assess management of a company. These questions have been given in appendix 7.1 at the end to this Unit.

On going through these questions, you will notice that finding good answers to many of these questions is not easy. The security analyst who tries to find good answers to these questions must do some ingenuous' detective work, possess a high degree of sensitivity and spend hours of hard research. We may however point out here some critical aspects of company management, which every investor must carefully probe. These are *commitment and competence, future orientation, image building, investor friendliness and government relation building.*

As far as commitment is concerned, the investors must look up the past record .of management to particularly see that it did not indulge in premature diversion of funds from one company to another. The competence of the management may be viewed in terms of the composition of the board, professional qualifications and experience of the members of board and the chief executive. The future orientation of a company management can be gauged through research and development expenditure, managerial development and training expenses and unexhausted fund-raising capacity of the company.

It is also important to undertake sufficient image building activities for a company. The image building activities of a management will be reflect in its community development activities and management of relations with the press and media. The investor friendliness of the management can be assessed from its dividend policies, i.e. payment of dividend in cash or kind and issue of bonus shares. Management of shareholder grievances can give fair idea about the investor friendliness of company management.

Another aspect of company management, which is particularly important in a country like India, characterised by high degree of government regulation, is its track record of managing relations with the government. How many capacity renewals/expansions could it win from the government? And in how much time? The answers to these questions can be fairly insightful about the capability of the company management to manage government relation, which holds very high significance particularly in an economy characterised by widespread government regulation of business and industry.

We may conclude by stating that management, though most difficult to evaluate, holds the real key to the quality of equity investment decision. As part of fundamental analysis, company management must be evaluated for its commitment, competence and capacity to manage operations of the company and shareholder, community and government relations. Past track record of the management in this regard can come handy. The problem is particularly challenging where it is a new management, without having past track record. Such a situation would perhaps demand venture capitalist skills.

Activity-3

a)   Take recent financial statements of any company and calculate the value of its equity share using the dividend discounted method and P/E ratio approach.

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b)   Compare the values calculated by the above methods with the market price of its share? Are these the same? If there is any difference, give possible reasons.

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7.9   SUMMARY

The analysis of a company is important as it is in the shares of a company that an investor invests. This requires forecasting both future price of the share as well as dividends. Future price of the share can be calculated using two approaches: discounted dividend model and WE ratio approach. Earnings per share is the most important and widely used variable in valuing equity share. Forecasting EPS is very crucial for investment decision making. There are traditional as well as modem methods of forecasting EPS. Traditional methods are ROI approach, Market share approach, and independent estimation approach. These methods provide a point estimate of the forecasted variable. Modern forecasting methods are: regression and correlation analysis, trend analysis, decision tree analysis and simulation. Decision tree and simulation methods provide a range of values with probability of their outcomes. Such information are quite useful in making investment decisions. However, this calls for generating information regarding probabilities of occurrence of various outcomes. The common limitation of these approaches is that these are quantitative in nature. Investor must try to find the reasonableness of the value of the share by taking into account the qualitative factors. Company management constitutes most difficult, Yet most critical, qualitative factor to be analysed by the investor or investment analyst. Past track record of the company management would come handy here. However to analyze a new management, without having past track record, perhaps the skills of the venture capitalist are needed.

7.10   SELF-ASSESSMENT QUESTIONS/EXERCISES

1.   Why do you think company analysis is important for equity investment decision?

2.   `Estimation of equity price is the main challenge in the entire process of equity investment decision'. Comment.

3.   What are different methods of quantitative analysis used for equity investment decision? How do they differ from qualitative analysis?

4.   What are different methods of forecasting EPS? Which one do you consider the best and why?

5.   Using imaginary data explain and illustrate decision tree analysis for forecasting EPS.

6.   `Evaluation of management is the main challenge in company analysis.' Comment, and explain how would you go about it.

7.   Write short notes on the following?

   a)   Dividend Discounted Method

   b)   Price-Earnings Approach

   c)   ROI Approach

   d)   Market Share Approach

   e)   Independent Estimates Approach

8.   Three months after learning of the death of his uncle, Mahesh got letter from Digpaul & Associates, attornies at law, that read in part as follows:

" ....and therefore, you will receive from your uncle's estate the following securities.

200 Shipping Industry Debendutes

   Par value: Rs, 100

   Coupon: 11.5 percent, compounded semiannually

   Maturity: December 31, 2007

   Current yield: 13.8

250 Ferros metal Industry bonds

> Par value Rs. 100
>
> Coupon: 12 percent, compounded semiannually Maturity: June 30, 2006
>
> Current yield: 13 percent

300 Shares, Ferros metal Preferred stock

> Par value: Rs. 10
>
> Indicated dividend: 1 I percent Maturity: None
>
> Crrent yield: 15 percent

These securities may be picked up by you or your representative at our office at any time after December 31, 2002."

Mahesh was very pleased to be remembered in his uncle's will but was less than pleased with a portfolio consisting of fixed income securities. Being a young man with family responsibilities, Mahesh decided that he was more interested in capital growth than fixed income. He called Lal and Co., his broker, and asked for some advice. In response he received the following letter:

> "I am delighted to hear of your good fortune and of your desire to invest in high quality securities. May I suggest that you invest in Maharashtra Cement and Hind Petro, two fine companies with excellent prospects for their common stocks. I enclose our recent write-ups on each company. If you decide to invest in common stock, let me know and I would be pleased to liquidate your fixed income holdings."

After looking over the prospects for the two companies, Mahesh has decided that either company would suit his needs, provided it offered 24 percent before tax return on his investment in the common stock. He has decided to liquidate his current portfolio and invest in the firm whose stock is most realistically priced, if the stock also offers a return of at least 24 percent.

Required

1   What is the current value of Mahesh's portfolio?

2   What are the intrinsic values of the common stock of Maharashtra and Hind?

3   Which stock is the best buy? Why?

Maharashtra Cement

			Projected	
	2001	2002	2003	2004
Revenues	411	453	500	550
Net income	73	80	88	97
Earnings per share	Rs.12.2	Rs.13.0	Rs. 14.7	Rs. 16.2
Dividends per share	Rs.5.0	Rs. 5.5	Rs. 6.0	Rs. 6.5
Market Price				
Average for year	Rs. 80	Rs. 90		
High for year	Rs. 130	Rs. 140		
Low for year	Rs. 60	Rs. 70		
10-year growth rate:				
1993 - 2002	12percent annually			
2003 - 2012	10percent annually			
Shares outstanding, September 30, 2002: 6,150,000 shares				
Market price, December 31, 2002: Rs. 85				

Hind Petro

	2002	2003	Projected 2004	Projected 2005
Revenues	897	1022	1165	1330
Net income	179	204	223	266
Earnings per share	Rs. 17.9	Rs. 20.4	Rs. 23.3	Rs. 26.6
Dividends per share	Rs. 7.0	Rs. 8.0	Rs. 9.5	Rs. 11.0
Market Price				
Average for year	Rs. 180	Rs. 210		
High for year	Rs. 270	Rs. 310		
Low for year	Rs. 110	Rs. 150		

10-year growth rate:

1993 - 2002   12 per cent annually

2003 - 2012   10 per cent annually

Shares outstanding, September 30, 2002: 10 million

Market price, December 31, 2002: Rs.160

7.11   FURTHER READINGS

Amling, F. 1984, Investment - *An Introduction to Analysis and management,* ed., PHI; New Delhi.

Fischer, D.E., and R.J. Jordan, 1995, *Security Analysis and Portfolio Management,* ed. PHI, New Delhi.

Francis J.C., 1983, *Management* o f *Investment,* McGraw-Hill (International Student Edition)

Appendix - 7.1

J.C. Francis, in his book, Management of Investment (1983) suggested the following list of questions which may be used to evaluate the management of a company.

1. Is management aggressive and growth oriented?

2. Is management looking ahead or resting on its part accomplishment?

3. Does the firm plan ahead, or is it managed by crisis?
4. Does the firms executives appear to have energy and good leadership instincts? Or, are the executives tired, dull , educationally deficient unable to answer questions satisfactorily too young, too old or experienced?

5. Is the firm well diversified?

6. Does one customer provide most of the firm sales?

7. Does one product line provide most of the firm's sales?

8. Does the firm use only one marketing channel for its sales?
9. Is the firm a timebomb that is about to explode like lockhead was in early 1969? (Witnessing significant drop in sale).

10. Does the firm appear to have an adequate R & D program?
11. Is the industry in which the firm is located experiencing an increasing or decreasing sales trend?

12. If the trend is downward does the firm have a product that is becoming

    obsolete?
13. If this is the case, is the firm pouring all available funds into new product development while also seekings growing firm with which to merge?
14. Even if the company is profitable and is enjoying sales growth, does it nevertheless retain some of its current earnings for R&D expenditure?

15. Does the firm properly utilises its board of directors?
16. Does the board have many of the firm's own executives on it or does the board largely consist of component executives from outside the firm, as it should?
17. Does the board of directors have access to information it needs to properly oversee and direct the firm?
18. Does management satisfactorily respond to vigorous questioning by the board at regular intervals?

19. Does the firm have management depth?
20. Is it firm run by someone whose ego won't permit other competent managers to develop, or does the firm have an established chain of command?

21. Are authority and responsibility delegated are decentralised?
22. Does the firm have a good team of middle managers being groomed to take over some day?

23. Are junior executives being developed properly?

24. Is management dynamic and flexible?
25. Do the firm's managers have the foresight and self-confidence needed to make the decisions essential to earnings high rates of profit?
26. Is the company profitable?

27. Is each product line profitable or at least potentially profitable?

28. Is each of the firm subsidiaries making its fair contribution to the parent corporation?

29. How high are the firm's profits margins compared with those of its competitors?

30. How does the firm's rate of return on equity compare to the returns available in equally risky industries?

31. Does the firm maintain or even augments its cash dividend payouts?

32. Is the firm keeping up with business development?

33. Are computers being used as they should be within the firm?

34. Is the company cleaning up its own messes or might the Environment Protection Agency sue the firm in order to force compliance with the pollution laws?

35. Does the firm hire fairly from among groups that have suffered the effects of discrimination?

36. Does the firm use inflation adjusted accounting statements?

37. Are the annual reports to shareholders informative or are they just pretty pictures and stories that flatter the firm's management?

38. Are managers properly compensated?

39. Do top executives have their initiative stifled by fixed salaries or are bonuses, stock options and other incentives used to motivate top managers?

40. Does the management team have enough experience?

41. Does the firm promote people too quickly or too slowly?

42. Are too many or too few outsiders hired into top management slots?

43. Are executives fired so frequently as to make the remaining executives nervous about their own job security?

44. At the other extreme are top management job used as retirement positions for old and sometimes incompetent executives?