NCFM

NSE's CERTIFICATION IN FINANCIAL MARKETS

Fundamental Analysis Module

NATIONAL STOCK EXCHANGE OF INDIA LIMITED

Test Details:

Sr. No.	Name of Module	Fees (Rs.)	Test Duration (in minutes)	No. of Questions	Maximum Marks	Pass Marks (%)	Certificate Validity
1	Financial Markets: A Beginners' Module *	1500	120	60	100	50	5
2	Mutual Funds : A Beginners' Module	1500	120	60	100	50	5
3	Currency Derivatives: A Beginner's Module	1500	120	60	100	50	5
4	Equity Derivatives: A Beginner's Module	1500	120	60	100	50	5
5	Interest Rate Derivatives: A Beginner's Module	1500	120	60	100	50	5
6	Commercial Banking in India: A Beginner's Module	1500	120	60	100	50	5
7	Securities Market (Basic) Module	1500	105	60	100	60	5
8	Capital Market (Dealers) Module *	1500	105	60	100	50	5
9	Derivatives Market (Dealers) Module *	1500	120	60	100	60	3
10	FIMMDA-NSE Debt Market (Basic) Module	1500	120	60	100	60	5
11	Investment Analysis and Portfolio Management Module	1500	120	60	100	60	5
12	Fundamental Analysis Module	1500	120	60	100	60	5
13	Banking Sector Module	1500	120	60	100	60	5
14	Insurance Module	1500	120	60	100	60	5
15	Macroeconomics for Financial Markets Module	1500	120	60	100	60	5
16	NISM-Series-I: Currency Derivatives Certification Examination	1000	120	60	100	60	3
17	NISM-Series-II-A: Registrars to an Issue and Share Transfer Agents – Corporate Certification Examination	1000	120	100	100	50	3
18	NISM-Series-II-B: Registrars to an Issue and Share Transfer Agents – Mutual Fund Certification Examination	1000	120	100	100	50	3
19	NISM-Series-IV: Interest Rate Derivatives Certification Examination	1000	120	100	100	60	3
20	NISM-Series-V-A: Mutual Fund Distributors Certification Examination *	1000	120	100	100	50	3
21	NISM-Series-VI: Depository Operations Certification Examination	1000	120	100	100	60	3
22	NISM Series VII: Securities Operations and Risk Management Certification Examination	1000	120	100	100	50	3
23	Certified Personal Financial Advisor (CPFA) Examination	4000	120	80	100	60	3
24	NSDL–Depository Operations Module	1500	75	60	100	60 #	5
25	Commodities Market Module	1800	120	60	100	50	3
26	Surveillance in Stock Exchanges Module	1500	120	50	100	60	5
27	Corporate Governance Module	1500	90	100	100	60	5
28	Compliance Officers (Brokers) Module	1500	120	60	100	60	5
29	Compliance Officers (Corporates) Module	1500	120	60	100	60	5
30	Information Security Auditors Module (Part-1)	2250	120	90	100	60	2
	Information Security Auditors Module (Part-2)	2250	120	90	100	60	
31	Options Trading Strategies Module	1500	120	60	100	60	5
32	FPSB India Exam 1 to 4**	2000 per exam	120	75	140	60	NA
33	Examination 5/Advanced Financial Planning **	5000	240	30	100	50	NA
34	Equity Research Module ##	1500	120	65	100	55	2
35	Issue Management Module ##	1500	120	80	100	55	2
36	Market Risk Module ##	1500	120	50	100	55	2
37	Financial Modeling Module ###	1000	150	50	75	50	NA

* Candidates have the option to take the tests in English, Gujarati or Hindi languages.

\# Candidates securing 80% or more marks in NSDL-Depository Operations Module ONLY will be certified as 'Trainers'.

** Following are the modules of Financial Planning Standards Board India (Certified Financial Planner Certification)

- FPSB India Exam 1 to 4 i.e. (i) Risk Analysis & Insurance Planning (ii) Retirement Planning & Employee Benefits (iii) Investment Planning and (iv) Tax Planning & Estate Planning
- Examination 5/Advanced Financial Planning

Modules of Finitiatives Learning India Pvt. Ltd. (FLIP)

Module of IMS Proschool

The curriculum for each of the modules (except Modules of Financial Planning Standards Board India, Finitiatives Learning India Pvt. Ltd. and IMS Proschool) is available on our website: www.nseindia.com > Education > Certifications.

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Distribution of weights of the
Fundamental Analysis Module Curriculum

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Note: Candidates are advised to refer to NSE's website: www.nseindia.com, click on 'Education' link and then go to 'Updates & Announcements' link, regarding revisions/updations in NCFM modules or launch of new modules, if any.

Chapter 1 : Fundamental Analysis: An Introduction

1.1 What is fundamental analysis?

Fundamental analysis is a stock valuation methodology that uses **financial** and **economic analysis** to envisage the movement of stock prices. The fundamental data that is analysed could include a company's financial reports and non-financial information such as estimates of its growth, demand for products sold by the company, industry comparisons, economy-wide changes, changes in government policies etc.

The outcome of fundamental analysis is a value (or a range of values) of the stock of the company called its 'intrinsic value' (often called 'price target' in fundamental analysts' parlance). To a fundamental investor, the market price of a stock tends to revert towards its intrinsic value. If the intrinsic value of a stock is above the current market price, the investor would purchase the stock because he believes that the stock price would rise and move towards its intrinsic value. If the intrinsic value of a stock is below the market price, the investor would sell the stock because he believes that the stock price is going to fall and come closer to its intrinsic value.

To find the intrinsic value of a company, the fundamental analyst initially takes a top-down view of the economic environment; the current and future overall health of the economy as a whole. After the analysis of the *macro*-economy, the next step is to analyse the industry environment which the firm is operating in. One should analyse all the factors that give the firm a competitive advantage in its sector, such as, management experience, history of performance, growth potential, low cost of production, brand name etc. This step of the analysis entails finding out as much as possible about the industry and the inter-relationships of the companies operating in the industry as we have seen in the previous NCFM module[1]. The next step is to study the company and its products.

Some of the questions that should be asked while taking up fundamental analysis of a company would include:

1. **What is the general economic environment in which the company is operating? Is it conducive or obstructive to the growth of the company and the industry in which the company is operating?**

   For companies operating in emerging markets like India, the economic environment is one of growth, growing incomes, high business confidence etc. As opposed to this a company may be operating in a developed but saturated market with stagnant incomes, high competition and lower relative expectations of incremental growth.

[1] Please see NCFM's Investment Analysis and Portfolio Management module for details.

2. **How is the political environment of the countries/markets in which the company is operating or based?**

A stable political environment, supported by law and order in society leads to companies being able to operate without threats such as frequent changes to laws, political disturbances, terrorism, nationalization etc. Stable political environment also means that the government can carry on with progressive policies which would make doing business in the country easy and profitable.

3. **Does the company have any core competency that puts it ahead of all the other competing firms?**

Some companies have patented technologies or leadership position in a particular segment of the business that puts them ahead of the industry in general. For example, Reliance Industries' core competency is its low-cost production model whereas Apple's competency is its design and engineering capabilities adaptable to music players, mobile phones, tablets, computers etc.

4. **What advantage do they have over their competing firms?**

Some companies have strong brands; some have assured raw material supplies while others get government subsidies. All of these may help firms gain a competitive advantage over others by making their businesses more attractive in comparison to competitors. For example, a steel company that has its own captive mines (of iron ore, coal) is less dependent and affected by the raw material price fluctuations in the marketplace. Similarly, a power generation company that has entered into power purchase agreements is assured of the sale of the power that it produces and has the advantage of being perceived as a less risky business.

5. **Does the company have a strong market presence and market share? Or does it constantly have to employ a large part of its profits and resources in marketing and finding new customers and fighting for market share?**

Competition generally makes companies spend large amounts on advertising, engage in price wars by reducing prices to increase market shares which may in turn erode margins and profitability in general. The Indian telecom industry is an example of cut throat competition eating into companies' profitability and a vigorous fight for market share. On the other hand there are very large, established companies which have a leadership position on account of established, large market share. Some of them have near-monopoly power which lets them set prices leading to constant profitability.

1.2 Why is fundamental analysis relevant for investing?

There are numerous ways of taking investment decisions in the market such as fundamental and technical analysis as seen in the previous NCFM module[2].

Let's take a look at some reasons why fundamental analysis is used for stock-picking in the markets?

1.2.1 Efficient Market Hypothesis (EMH)

Market efficiency refers to a condition in which current prices reflect all the publicly available information about a security. The basic idea underlying market efficiency is that competition will drive all information into the stock price quickly. Thus EMH states that it is impossible to 'beat the market' because stock market efficiency causes existing share prices to always incorporate and reflect all relevant information. According to the EMH, stocks always tend to trade at their fair value on stock exchanges, making it impossible for investors to either consistently purchase undervalued stocks or sell stocks at inflated prices. As such, it should be impossible to outperform the overall market through expert stock selection or market timing and that the only way an investor can possibly obtain higher returns is by purchasing riskier investments. The EMH has three versions, depending on the level on information available:

Weak form EMH

The weak form EMH stipulates that current asset prices reflect past price and volume information. The information contained in the past sequence of prices of a security is fully reflected in the current market price of that security. The weak form of the EMH implies that investors should not be able to outperform the market using something that "everybody else knows". Yet, many financial researchers study past stock price series and trading volume (using a technique called technical analysis) data in an attempt to generate profits.

Semi-strong form EMH

The semi-strong form of the EMH states that all publicly available information is similarly already incorporated into asset prices. In other words, all publicly available information is fully reflected in a security's current market price. Public information here includes not only past prices but also data reported in a company's financial statements, its announcements, economic factors and others. It also implies that no one should be able to outperform the market using something that *"everybody else knows"*. The semi-strong form of the EMH thus indicates that a company's financial statements are of no help in forecasting future price movements and securing high investment returns in the long-term.

[2] Please see NCFM's Investment Analysis and Portfolio Management module for details.

Strong form EMH

The strong form of the EMH stipulates that private information or insider information too is quickly incorporated in market prices and therefore cannot be used to reap abnormal trading profits. Thus, all information, whether public or private, is fully reflected in a security's current market price. This means no long-term gains are possible, even for the management of a company, with access to insider information. They are not able to take the advantage to profit from information such as a takeover decision which may have been made a few minutes ago. The rationale to support this is that the market anticipates in an unbiased manner, future developments and therefore information has been incorporated and evaluated into market price in a much more objective and informative way than company insiders can take advantage of.

Although it is a cornerstone of modern financial theory, the EMH is controversial and often disputed by market experts. In the years immediately following the hypothesis of market efficiency (EMH), tests of various forms of efficiency had suggested that the markets are reasonably efficient and beating them was not possible. Over time, this led to the gradual acceptance of the efficiency of markets. Academics later pointed out a number of instances of long-term deviations from the EMH in various asset markets which lead to arguments that markets are not always efficient. Behavioral economists attribute the imperfections in financial markets to a combination of cognitive biases such as overconfidence, overreaction, representative bias, information bias and various other predictable human errors in reasoning and information processing. Other empirical studies have shown that picking low P/E stocks can increase chances of beating the markets. Speculative economic bubbles are an anomaly when it comes to market efficiency. The market often appears to be driven by buyers operating on irrational exuberance, who take little notice of underlying value. These bubbles are typically followed by an overreaction of frantic selling, allowing shrewd investors to buy stocks at bargain prices and profiting later by beating the markets. Sudden market crashes are mysterious from the perspective of efficient markets and throw market efficiency to the winds. Other examples are of investors, who have consistently beaten the market over long periods of time, which by definition should not be probable according to the EMH. Another example where EMH is purported to fail are anomalies like cheap stocks outperforming the markets in the long term.

1.2.2 Arguments against EMH

Alternative prescriptions about the behaviour of markets are widely discussed these days. Most of these prescriptions are based on the irrationality of the markets in, either processing the information related to an event or based on biased investor preferences.

The Behavioural Aspect

Behavioural Finance is a field of finance that proposes psychology-based theories to explain stock market anomalies. Within behavioural finance, it is assumed that information structure and the characteristics of market participants systematically influence individuals' investment decisions as well as market outcomes.

In a market consisting of human beings, it seems logical that explanations rooted in human and social psychology would hold great promise in advancing our understanding of stock market behaviour. More recent research has attempted to explain the persistence of anomalies by adopting a psychological perspective. Evidence in the psychology literature reveals that individuals have limited information processing capabilities, exhibit systematic bias in processing information, are prone to making mistakes, and often tend to rely on the opinion of others.

The literature on cognitive psychology provides a promising framework for analysing investors' behaviour in the stock market. By dropping the stringent assumption of rationality in conventional models, it might be possible to explain some of the persistent anomalous findings. For example, the observation of overreaction of the markets to news is consistent with the finding that people, in general, tend to overreact to new information. Also, people often allow their decision to be guided by irrelevant points of reference, a phenomenon called "anchoring and adjustment". Experts propose an alternate model of stock prices that recognizes the influence of social psychology. They attribute the movements in stock prices to social movements. Since there is no objective evidence on which to base their predictions of stock prices, it is suggested that the final opinion of individual investors may largely reflect the opinion of a larger group. Thus, excessive volatility in the stock market is often caused by social "fads" which may have very little rational or logical explanation.

There have been many studies that have documented long-term historical phenomena in securities markets that contradict the efficient market hypothesis and cannot be captured plausibly in models based on perfect investor rationality. Behavioural finance attempts to fill that void.

Regulatory Hindrances

In the real world, many a times there are regulatory distortions on the trading activity of the stocks such as restrictions on short-selling or on the foreign ownership of a stock etc. causing inefficiencies in the fair price discovery mechanism. Such restrictions hinder the process of fair price discovery in the markets and thus represent deviation from the fair value of the stock. Then there may be some restrictions on the price movement itself (such as price bands and circuit filters which prevent prices of stocks moving more than a certain percentage during the day) that may prevent or delay the efficient price discovery mechanism. Also,

many institutional investors and strategic investors hold stocks despite deviation from the fair value due to lack of trading interest in the stock in the short term and that may cause some inefficiencies in the price discovery mechanism of the market.

1.2.3 So, does fundamental analysis work?

In the EMH, investors have a long-term perspective and return on investment is determined by a rational calculation based on changes in the long-run income flows. However, in the markets, investors may have shorter horizons and returns also represent changes in short-run price fluctuations. Recent years have witnessed a new wave of researchers who have provided thought provoking, theoretical arguments and provided supporting empirical evidence to show that security prices could deviate from their equilibrium values due to psychological factors, fads, and noise trading. That's where investors through fundamental analysis and a sound investment objective can achieve excess returns and beat the market.

1.3 Steps in Fundamental Analysis

Fundamental analysis is the cornerstone of investing. In fact all types of investing comprise studying some fundamentals. The subject of fundamental analysis is also very vast. However, the most important part of fundamental analysis involves delving into the financial statements. This involves looking at revenue, expenses, assets, liabilities and all the other financial aspects of a company. Fundamental analysts look at these information to gain an insight into a company's future performance.

Fundamental analysis consists of a systemtatic series of steps to examine the investment environment of a company and then identify opportunities. Some of these are:

- Macroeconomic analysis - which involves analysing capital flows, interest rate cycles, currencies, commodities, indices etc.
- Industry analysis - which involves the analysis of industry and the companies that are a part of the sector
- Situational analysis of a company
- Financial analysis of the company
- Valuation

The previous NCFM module[3] focused on macroeconomic and industry analysis, we would examine company analysis (financials) and valuation in this module.

[3] Please see NCFM's Investment Analysis and Portfolio Management module for details.

Chapter 2 : Brushing up the Basics

2.1 Concept of "Time value of Money"

The concept of time value of money arises from the relative importance of an asset now vs. in future. Assets provide returns and ownership of assets provides access to these returns. For example, Rs. 100 of today's money invested for one year and earning 5% interest will be worth Rs. 105 after one year. Hence, Rs. 100 now ought to be worth more than Rs. 100 a year from now. Therefore, any wise person would chose to own Rs. 100 now than Rs. 100 in future. In the first option he can earn interest on on Rs. 100 while in the second option he loses interest. This explains the 'time value' of money. Also, Rs. 100 paid now or Rs. 105 paid exactly one year from now both have the same value to the recipient who assumes 5% as the rate of interest. Using time value of money terminology, Rs. 100 invested for one year at 5% interest has a future value of Rs. 105. The method also allows the valuation of a likely stream of income in the future, in such a way that the annual incomes are discounted and then added together, thus providing a lump-sum "present value" of the entire income stream. For eg. If you earn Rs. 5 each for the next two years (at 5% p.a. simple interest) on Rs. 100, you would receive Rs. 110 after two years. The Rs. 110 you earn, can be discounted at 5% for two years to arrive at the present value of Rs. 110, i.e. Rs. 100.

Valuing future cash flows, that may arise from an asset such as stocks, is one of the cornerstones of fundamental analysis. Cash flows from assets make them more valuable now than in the future and to understand the relative difference we use the concepts of interest and discount rates. Interest rates provide the rate of return of an asset over a period of time, i.e., in future and discount rates help us determine what a future value of asset, value that would come to us in future, is currently worth.

The **present value** of an asset could be shown to be:

$$PV = \frac{FV}{(1+r)^t}$$

$$FV = PV * (1+r)^t$$

Where

PV = Present Value

FV = Future Value

r = Discount Rate

t = Time

2.2 Interest Rates and Discount Factors

So, what interest rate should we use while discounting the future cash flows? Understanding what is called as Opportunity cost is very important here.

2.2.1 Opportunity Cost

Opportunity cost is the cost of any activity measured in terms of the value of the other alternative that is not chosen (that is foregone). Put another way, it is the benefit you could have received by taking an alternative action; the difference in return between a chosen investment and one that is not taken. Say you invest in a stock and it returns 6% over a year. In placing your money in the stock, you gave up the opportunity of another investment - say, a fixed deposit yielding 8%. In this situation, your opportunity costs are 2% (8% - 6%).

But do you expect only fixed deposit returns from stocks? Certainly not. You expect to earn more than the return from fixed deposit when you invest in stocks. Otherwise you are better off with fixed deposits. The reason you expect higher returns from stocks is because the stocks are much riskier as compared to fixed deposits. This extra risk that you assume when you invest in stocks calls for additional return that you assume over other risk-free (or near risk-free) return.

The **discount rate** of cost of capital to be used in case of discounting future cash flows to come up with their present value is termed as Weighted Average Cost of Capital (WACC).

$$WACC = \frac{D}{TC} * Kd * (1 - t) + \frac{E}{TC} * Ke + \frac{P}{TC} * Kp$$

Where

D = Debt portion of the Total Capital Employed by the firm

TC = Total Capital Employed by the frim (D+E+P)

K_d = Cost of Debt of the Company.

t = Effective tax rate of the firm

E = Equity portion of the Total Capital employed by the firm

P = Preferred Equity portion of the Total Capital employed by the firm

K_p = Cost of Preferred Equity of the firm

The **Cost of equity** of the firm, K_e (or any other risky asset) is given by the Capital Asset Pricing Model (CAPM)

$$Ke = Rf + \beta * (Rm - Rf)$$

Or

$$Ke = Rf + \beta * (\text{Equity Risk Premium})$$

Where

R_f = Risk-free rate

β = Beta, the factor signifying risk of the firm

R_m = Implied required rate of return for the market

So what discount factors do we use in order to come up with the present value of the future cash flows from a company's stock?

2.2.2 Risk-free Rate

The risk-free interest rate is the theoretical rate of return of an investment with zero risk, including default risk. Default risk is the risk that an individual or company would be unable to pay its debt obligations. The risk-free rate represents the interest an investor would expect from an absolutely risk-free investment over a given period of time.

Though a truly risk-free asset exists only in theory, in practice most professionals and academics use short-dated government bonds of the currency in question. For US Dollar investments, US Treasury bills are used, while a common choice for EURO investments are the German government bonds or Euribor rates. The risk-free interest rate for the Indian Rupee for Indian investors would be the yield on Indian government bonds denominated in Indian Rupee of appropriate maturity. These securities are considered to be risk-free because the likelihood of governments defaulting is extremely low and because the short maturity of the bills protect investors from interest-rate risk that is present in all fixed rate bonds (if interest rates go up soon after a bond is purchased, the investor misses out on the this amount of interest, till the bond matures and the amount received on maturity can be reinvested at the new interest rate).

Though Indian government bond is a riskless security per se, a foreign investor may look at the India's sovereign risk which would represent some risk. As India's sovereign rating is not the highest (please search the internet for sovereign ratings of India and other countries) a foreign investor may consider investing in Indian government bonds as not a risk free investment.

For valuing Indian equities, we will take 10-Yr Government Bond as risk-free interest rate. (Roughly 7.8% - as of this writing).

2.2.3 Equity Risk Premium

The notion that risk matters and that riskier investments should have higher expected returns than safer investments, to be considered good investments, is both central to modern finance. Thus, the expected return on any investment can be written as the sum of the risk-free rate and a risk premium to compensate for the risk. The equity risk premium reflects fundamental

judgments we make about how much risk we see in an economy/market and what price we attach to that risk. In effect, the equity risk premium is the premium that investors demand for the average risk investment and by extension, the discount that they apply to expected cash flows with average risk. When equity risk premia rises, investors are charging a higher price for risk and will therefore pay lower prices for the same set of risky expected cash flows.

Equity risk premia are a central component of every risk and return model in finance and is a key input into estimating costs of equity and capital in both corporate finance and valuation.

2.2.4 The Beta

The Beta is a measure of the systematic risk of a security that cannot be avoided through diversification. Therefore, Beta measures non-diversifiable risk. It is a relative measure of risk: the risk of an individual stock relative to the market portfolio of all stocks. Beta is a statistical measurement indicating the volatility of a stock's price relative to the price movement of the overall market. Higher-beta stocks mean greater volatility and are therefore considered to be riskier but are in turn supposed to provide a potential for higher returns; low-beta stocks pose less risk but also lower returns.

The market itself has a beta value of 1; in other words, its movement is exactly equal to itself (a 1:1 ratio). *Stocks* may have a beta value of less than, equal to, or greater than one. An asset with a beta of 0 means that its price is not at all correlated with the market; that asset is independent. A positive beta means that the asset generally tracks the market. A negative beta shows that the asset inversely follows the market; the asset generally decreases in value if the market goes up.

$$\beta_{IM} = \frac{Cov_{im}}{\sigma_m^2}$$

where β_{IM} = Beta of security with market

Cov_{im} = Covariance between security and market

σ_m^2 = Variance of market returns

OR

$$\beta_{IM} = \rho_{im} \frac{\sigma_i}{\sigma_m}$$

Where ρ_{im} = Coefficient of Correlation between security and market returns

Consider the stock of ABC Technologies Ltd. which has a beta of 0.8. This essentially points to the fact that based on past trading data, ABC Technologies Ltd. as a whole has been relatively less volatile as compared to the market as a whole. Its price moves less than the market movement. Suppose Nifty index moves by 1% (up or down), ABC Technologies Ltd.'s price would move 0.80% (up or down). If ABC Technologies Ltd. has a Beta of 1.2, it is theoretically 20% more volatile than the market.

Higher-beta stocks tend to be more volatile and therefore riskier, but provide the potential for higher returns. Lower-beta stocks pose less risk but generally offer lower returns. This idea has been challenged by some, claiming that data shows little relation between beta and potential returns, or even that lower-beta stocks are both less risky and more profitable.

Beta is an extremely useful tool to consider when building a portfolio. For example, if you are concerned about the markets and want a more conservative portfolio of stocks to ride out the expected market decline, you'll want to focus on stocks with low betas. On the other hand, if you are extremely bullish on the overall market, you'll want to focus on high beta stocks in order to leverage the expected strong market conditions. Beta can also considered to be an indicator of expected return on investment. Given a risk-free rate of 2%, for example, if the market (with a beta of 1) has an expected return of 8%, a stock with a beta of 1.5 should return 11% (= 2% + 1.5(8% - 2%)).

Problems with Beta

The Beta is just a tool and as is the case with any tool, is not infallible. While it may seem to be a good measure of risk, there are some problems with relying on beta scores alone for determining the risk of an investment.

- Beta is not a sure thing. For example, the view that a stock with a beta of less than 1 will do better than the market during down periods may not always be true in reality. Beta scores merely suggest how a stock, based on its historical price movements will behave relative to the market. Beta looks backward and history is not always an accurate predictor of the future.
- Beta also doesn't account for changes that are in the works, such as new lines of business or industry shifts. Indeed, a stock's beta may change over time though usually this happens gradually.

As a fundamental analyst, you should never rely exclusively on beta when picking stocks. Rather, beta is best used in conjunction with other stock-picking tools.

2.2.5 Risk Adjusted Return (Sharpe Ratio)

The Sharpe ratio / Sharpe index / Sharpe measure / reward-to-variability ratio, is a measure of the excess return (or risk premium) per unit of risk in an investment asset or a trading strategy. It is defined as:

$$S = \frac{R - Rf}{\sigma}$$

Where, R is the asset return, R_f is the return on a benchmark asset such as the risk free rate of return, $[R - R_f]$ is the expected value of the excess of the asset return over the benchmark return and σ is the standard deviation of the asset.

The Sharpe ratio is a risk-adjusted measure of return that is often used to evaluate the performance of an asset or a portfolio. The ratio helps to make the performance of one portfolio comparable to that of another portfolio by making an adjustment for risk. It is excess return generated for an asset or a portfolio for every one unit of risk. For example, if stock A generates a return of 15% while stock B generates a return of 12%, it would appear that stock A is a better performer. However, if stock A, which produced the 15% return but has much larger risks than stock B (as reflected by standard deviation of stock returns or beta), it may actually be the case that stock B has a better risk-adjusted return. To continue with the example, say that the risk free-rate is 5%, and stock A has a standard deviation (risk) of 8%, while stock B has a standard deviation of 5%. The Sharpe ratio for stock A would be 1.25 while stock B's ratio would be 1.4, which is better than stock A. Based on these calculations, stock B was able to generate a higher return on a risk-adjusted basis. A ratio of 1 or better is considered good, 2 and better is very good, and 3 and better is considered excellent.

Chapter 3 : Understanding Financial Statements

As mentioned in Chapter 1, the most important part of fundamental analysis involves delving into the financial statements or financial reports of companies. Financial information, which accounting helps to standardize, is presented in the companies' financial reports. Indian listed companies must periodically report their financial statements to the investors and regulators. Why is this so? The laws and rules that govern the securities industry in the India derive from a simple and straightforward concept: all investors, whether large institutions or private individuals, should have access to certain basic facts about an investment prior to buying it. To achieve this, the Securities and Exchange Board of India (SEBI), the market regulator in India, requires public companies to disclose meaningful financial and other information to the public. This provides a common pool of knowledge for all investors to use to judge for themselves if a company's securities are a good investment. Only through the steady flow of timely, comprehensive and accurate information can people make sound investment decisions.

3.1 Where can one find financial statements?

Listed companies have to send all their shareholders annual reports. In addition, the quarterly financials of the company can be found on the stock exchanges' websites and on the website of the company. Here are the financial statements of a major IT services company, XYZ Technologies Ltd. (XYZ)

XYZ Technologies Limited

Comparative Balance Sheets

(All figures in Rs. Crs.)

	Mar '06	**Mar '07**	**Mar '08**	**Mar '09**	**Mar '10**
Sources of Funds					
Total Share Capital	138	286	286	286	287
Equity Share Capital	138	286	286	286	287
Share Application Money	0	0	0	0	0
Preference Share Capital	0	0	0	0	0
Reserves	6,759	10,876	13,204	17,523	21,749
Revaluation Reserves	0	0	0	0	0
Networth	**6,897**	**11,162**	**13,490**	**17,809**	**22,036**
Secured Loans	0	0	0	0	0
Unsecured Loans	0	0	0	0	0
Total Debt	0	0	0	0	0
Total Liabilities	**6,897**	**11,162**	**13,490**	**17,809**	**22,036**
Application Of Funds					
Gross Block	2,837	3,889	4,508	5,986	3,779

Less: Accumulated Depreciation	1,275	1,739	1,837	2,187	0
Net Block	**1,562**	**2,150**	**2,671**	**3,799**	**3,779**
Capital Work in Progress	571	957	1,260	615	409
Investments	**876**	**839**	**964**	**1,005.00**	**4,636.00**
Inventories	0	0	0	0	0
Sundry Debtors	1,518	2,292	3,093	3,390	3,244
Cash and Bank Balance	544	680	657	805	9,797
Total Current Assets	2,062	2,972	3,750	4,195	13,041
Loans and Advances	1,308	1,241	2,804	3,303	4,201
Fixed Deposits	2,735	4,827	5,772	8,234	0
Total Current Assets, Loans & Advances	**6,105**	**9,040**	**12,326**	**15,732**	**17,242**
Deferred Credit	0	0	0	0	0
Current Liabilities	**808**	**1,162**	**1,483**	**1,544**	**1,995**
Provisions	1,409	662	2,248	1,798	2,035
Total CL & Provisions	2,217	1,824	3,731	3,342	4,030
Net Current Assets	**3,888**	**7,216**	**8,595**	**12,390**	**13,212**
Miscellaneous Expenses	0	0	0	0	0
Total Assets	**6,897**	**11,162**	**13,490**	**17,809**	**22,036**

Comparative Income Statements

	Mar '06	**Mar '07**	**Mar '08**	**Mar '09**	**Mar '10**
Income					
Sales Turnover	9,028	13,149	15,648	20,264	21,140
Excise Duty	0	0	0	0	0
Net Sales	**9,028**	**13,149**	**15,648**	**20,264**	**21,140**
Other Income	144	379	683	502	958
Stock Adjustments	0	0	0	0	0
Total Income	**9,172**	**13,528**	**16,331**	**20,766**	**22,098**
Expenditure					
Raw Materials	16	22	18	20	0
Power & Fuel Cost	62	88	106	125	0
Employee Cost	4,274	6,316	7,771	9,975	10,356
Other Manufacturing Expenses	792	1,290	1,443	1,697	2,317
Selling and Admin Expenses	773	1,051	1,214	1,367	215
Miscellaneous Expenses		156	132	172	883
Preoperative Expense Capitalised	0	0	0	0	0
Total Expenses	**6,038**	**8,923**	**10,684**	**13,356**	**13,771**
Operating Profit	2,990	4,226	4,964	6,908	7,369
PBDIT	3,134	4,605	5,647	7,410	8,327
Interest	1	1	1	2	0
PBDT	3,133	4,604	5,646	7,408	8,327
Depreciation	409	469	546	694	807

Other Written Off	0	0	0	0	0
Profit Before Tax	2,724	4,135	5,100	6,714	7,520
Extra-ordinary items	0	-5	0	-1	0
Profits Before Tax (Post Extraordinary Items)	2,724	4,130	5,100	6,713	7,520
Tax	303	352	630	895	1,717
Reported Net Profit	**2,421**	**3,783**	**4,470**	**5,819**	**5,803**
Total Value Addition	6,022	8,901	10,666	13,336	13,771
Preference Dividend	0	0	0	0	0
Equity Dividend	1,238	649	1,902	1,345	1,434
Corporate Dividend Tax	174	102	323	228	240
Per share data (annualised)					
Shares in issue (lakhs)	2,756	5,712	5,720	5,728	5,728
Earnings Per Share (Rs)	**88**	**66**	**78**	**102**	**101**
Equity Dividend (%)	900	230	665	470	500

Statement of Cash Flows

	Mar '06	**Mar '07**	**Mar '08**	**Mar '09**	**Mar '10**
Net Profit Before Tax	**2724**	**4129**	**5100**	**6714**	**7472**
Cash Flow from Operations	2237	3256	3816	5152	5876
Cash Flow from Investing	-392	-1065	-978	-195	-3314
Cash Flow from Financing	244	-316	-777	-2430	-1486
Net (decrease) / increase In Cash	**2096**	**1871**	**2079**	**2600**	**1008**
Opening Cash	1683	3779	5610	7689	10289
Closing Cash	3779	5650	7689	10289	11297

The primary and most important source of information about a company are its Annual Reports, prepared and distributed to the shareholders by law each year. Annual Reports are usually well presented. A tremendous amount of data is given about the performance of a company over a period of time. If an Annual Report is impressive about the operations and future direction, if the company has made a profit and if a reasonable dividend has been paid, the average investor is typically content in the belief that the company is in good hands. However, for a fundamental analyst or for that matter any investor, this alone must not be the criterion by which to judge a company. The intelligent investor must read the annual report in depth; he must read between and beyond the lines; he must peep behind the figures and find the truth and only then should he decide whether the company is doing well or not.

The Annual Report is usually broken down into the following specific parts:

1. The Director’s Report
2. The Auditor’s Report
3. The Financial Statements and
4. The Schedules and Notes to the Accounts.

Each of these parts has a purpose and a story to tell.

3.1.1 The Director's Report

The Director's Report is a report submitted by the directors of a company to shareholders, informing them about the performance of the company, under their stewardship:

1. It enunciates the opinion of the directors on the state of the economy and the political situation vis-à-vis the company.
2. Explains the performance and the financial results of the company in the period under review. This is an extremely important part. The results and operations of the various separate divisions are usually detailed and investors can determine the reasons for their good or bad performance.
3. The Director's Report details the company's plans for modernization, expansion and diversification. Without these, a company will remain static and eventually decline.
4. Discusses the profits earned in the period under review and the dividend recommended by the directors. This paragraph should normally be read with sane scepticism as the directors will always argue that the performance was satisfactory. If profits have improved the reasons stated would invariably be superior technology adopted, intense marketing and hard work in the face of severe competition etc. If profits are low, adverse economic conditions are usually blamed for the same.
5. Elaborates on the directors' views of the company's prospects for the future.
6. Discusses plans for new acquisitions and investments.

An investor must intelligently evaluate the issues raised in a Director's Report. If the report talks about diversification, one must the question that though diversification is a good strategy, does it make sense for the company? Industry conditions, the management's knowledge of the new business must be considered. Although companies must diversify in order to spread the risks of economic slumps, every diversification may not suit a company. Similarly, all other issues raised in the Director's Report should be analysed. Did the company perform as well as others in the same industry? Is the finance being raised the most logical and beneficial to the company? It is imperative that the investor read between the lines of the Director's Report and find the answers to these and many other questions. In short, a Director's Report is valuable and if read intelligently can give the investor a good grasp of the workings of a company, the problems it faces, the direction it intends taking and its future prospects.

3.1.2 The Auditor's Report

The auditor represents the shareholders and it is the auditor's duty to report to the shareholders and the general public on the stewardship of the company by its directors. Auditors are required to report whether the financial statements presented do in fact present a true and fair view of the state of the company. Investors must remember that the auditors are required by law to point out if the financial statements are true and fair. They are also required to report any

change, such as a change in accounting principles or the non-provision of charges that result in an increase or decrease in profits. It is really the only impartial report that a shareholder or investor receives and this alone should spur one to scrutinize the auditor's report minutely. Unfortunately, more often than not it is not read. There can be interesting contradictions. It was stated in the Auditor's Report of ABC Co. Ltd. for the year 1999-2000 that, "As at the year-end 31st March 2000 the accumulated losses exceed the net worth of the Company and the Company has suffered cash losses in the financial year ended 31st March 2000 as well as in the immediately preceding financial year. In our opinion, therefore, the Company is a sick industrial company within the meaning of clause (O) of Section 3(1) of the Sick Industrial Companies (Special Provisions) Act 1985". The Director's report however stated, "The financial year under review has not been a favourable year for the Company as the computer industry in general continued to be in the grip of recession. High input costs as well as resource constraints hampered operations. The performance of your Company must be assessed in the light of these factors. During the year manufacturing operations were curtailed to achieve cost effectiveness. Your directors are confident that the efforts for increased business volumes and cost control will yield better results in the current year". The auditors were of the opinion that the company was sick whereas the directors spoke optimistically of their hope that the future would be better! They could not, being directors, state otherwise.

At times, accounting principles are changed or creative and innovative accounting practices resorted to by some companies in order to show a better result. The effect of these changes is at times not detailed in the notes to the accounts. The Auditor's Report will always draw the attention of the reader to these changes and the effect that these have on the financial statements. It is for this reason that a careful reading of the Auditor's Report is not only necessary but mandatory for an investor.

3.1.3 Financial Statements

The published financial statements of a company in an Annual Report consist of its **Balance Sheet** as at the end of the accounting period detailing the financing condition of the company at that date and the **Profit and Loss Account** or **Income Statement** summarizing the activities of the company for the accounting period and the **Statement of Cash Flows** for the accounting period.

3.1.3.1 Balance Sheet

The Balance Sheet details the financial position of a company on a particular date; the company's assets (that which the company owns), and liabilities (that which the company owes), grouped logically under specific heads. It must however, be noted that the Balance Sheet details the financial position on a particular day and that the position can be materially different on the next day or the day after.

Sources of funds

A company has to source funds to purchase fixed assets, to procure working capital and to fund its business. For the company to make a profit, the funds have to cost less than the return the company earns on their deployment.
Where does a company raise funds? What are the sources?
Companies raise funds from its shareholders and by borrowing.

a) Shareholders' Funds (Total Share Capital in XYZ's Balance Sheet)

A company sources funds from shareholders by the issue of shares. Shareholders' funds is the balance sheet value of shareholders' interest in a company. For the accounts of a company with no subsidiaries it is total assets minus total liabilities. For consolidated group accounts the value of minority interests is excluded. Minority interest refers to the portion of a subsidiary corporation's stock that is not owned by the parent corporation.

Shareholders' funds represent the stake shareholders have in the company, the investment they have made.

- **Share Capital**

Share capital represents the shares issued to the public. This is issued in following ways:

- **Private Placement -** This is done by offering shares to selected individuals or institutions.
- **Public Issue -** Shares are offered to public. The details of the offer, including the reasons for raising the money are detailed in a prospectus and it is important that investors read this.
- **Rights issues -** Companies may also issue shares to their shareholders as a matter of right in proportion to their holding. So, if an investor has 100 shares and a company announces a 2:1 rights, the investor stands to gain an additional 200 shares. Rights issues come at a price which the investors must pay by subscribing to the rights offer. The rights issues were often offered at a price lower than the company's market value and shareholders stood to gain. With the freedom in respect of pricing of shares now available, companies have begun pricing their offerings nearer their intrinsic value. Consequently, many of these issues have not been particularly attractive to investors and several have failed to be fully subscribed. However, strong companies find subscribers to thier rights issues as investors are of the view that their long term performance would lead to increase in share prices.
- **Bonus shares -** When a company has accumulated a large reserves out of profits, the directors may decide to distribute a part of it amongst the shareholders in the form of bonus. Bonus can be paid either in cash or in the form of shares. Cash bonus is paid in the form of dividend by the company when it has large accumulated profits as well

as cash. Many a times, a company is not in a position to pay bonus in cash (dividend) in spite of sufficient profits because of unsatisfactory cash position or because of its adverse effects on the working capital of the company. In such a case, the company pays a bonus to its shareholders in the form of shares. Bonus shares are shares issued free to shareholders by capitalizing reserves. No monies are actually raised from shareholders. Nothing stops a company from declaring a bonus and dividend together if it has large accumulated profits as well as cash.

Reserves - Reserves are profits or gains which are retained and not distributed. Companies have two kinds of reserves - capital reserves and revenue reserves:

- **Capital Reserves –** Capital reserves are gains that have resulted from an increase in the value of assets and they are not freely distributable to the shareholders. The most common capital reserves one comes across are the share premium account arising from the issue of shares at a premium and the capital revaluation reserve, i.e. unrealized gain on the value of assets.
- **Revenue Reserves -** These represent profits from operations ploughed back into the company and not distributed as dividends to shareholders. It is important that all the profits are not distributed as funds are required by companies to purchase new assets to replace existing ones, for expansion and for working capital.

b) Loan Funds

The other source of funds a company has access to is borrowings. Borrowing is often preferred by companies as it is quicker, relatively easier and the rules that need to be complied with are much less. The loans taken by companies are either :

- **Secured loans -** These loans are taken by a company by pledging some of its assets or by a floating charge on some or all of its assets. The usual secured loans a company has are debentures and term loans.
- **Unsecured loans -** Companies do not pledge any assets when they take unsecured loans. The comfort a lender has is usually only the good name and credit worthiness of the company. The more common unsecured loans of a company are fixed deposits and short term loans. In case a company is dissolved, unsecured lenders are usually paid after the secured lenders have been paid. Borrowings or credits for working capital which fluctuate such as bank overdrafts and trade creditors are not normally classified as loan funds but as current liabilities.

Fixed Assets (Net Block in XYZ's Balance Sheet) - Fixed assets are assets that a company owns for use in its business and to produce goods. Typically it could be machinery. They are not for resale and comprises of land, buildings i.e. offices, warehouses and factories, vehicles, machinery, furniture, equipment and the like. Every company has some fixed assets though

the nature or kind of fixed assets vary from company to company. A manufacturing company's major fixed assets would be its factory and machinery, whereas that of a shipping company would be its ships. Fixed assets are shown in the Balance Sheet at cost less the accumulated depreciation. Depreciation is based on the very sound concept that an asset has a useful life and that after years of toil it wears down. Consequently, it attempts to measure that wear and tear and to reduce the value of the asset accordingly so that at the end of its useful life, the asset will have no value.

As depreciation is a charge on profits, at the end of its useful life, the company would have set aside from profits an amount equal to the original cost of the asset and this could be utilized to purchase another asset. However, in the inflationary times, this is inadequate and some companies create an additional reserve to ensure that there are sufficient funds to replace the worn out asset. The common methods of depreciation are:

- **Straight line method -** The cost of the asset is written off equally over its life. Consequently, at the end of its useful life, the cost will equal the accumulated depreciation.
- **Reducing balance method -** Under this method, depreciation is calculated on the written down value, i.e. cost less depreciation. Consequently, depreciation is higher in the beginning and lower as the years progress. An asset is never fully written off as the depreciation is always calculated on a reducing balance.

Land is the only fixed asset that is never depreciated as it normally appreciates in value. Capital work in progress - factories being constructed, etc. - are not depreciated until it is a fully functional asset.

Investments

Many companies purchase investments in the form of shares or debentures to earn income or to utilize cash surpluses profitably. The normal investments a company has are:

- **Trade investments -** Trade investments are normally shares or debentures of competitors that a company holds to have access to information on their growth, profitability and other details.
- **Subsidiary and associate companies -** These are shares held in subsidiary or associate companies. The large business houses hold controlling interest in several companies through cross holdings in subsidiary and associate companies.
- **Others -** Companies also often hold shares or debentures of other companies for investment or to park surplus funds.

Investments are also classified as quoted and unquoted investments. Quoted investments are shares and debentures that are quoted in a recognized stock exchange and can be freely traded. Unquoted investments are not listed or quoted in a stock exchange. Consequently, they are not liquid and are difficult to dispose of.

Investments are valued and stated in the balance sheet at either the acquisition cost or market value, whichever is lower. This is in order to be conservative and to ensure that losses are adequately accounted for.

Current assets - Current assets are assets owned by a company which are used in the normal course of business or are generated by the company in the course of business such as debtors or finished stock or cash.

The rule of thumb is that any asset that is turned into cash within twelve months is a current asset. Current assets can be divided essentially into three categories :

- **Converting assets -** Assets that are produced or generated in the normal course of business, such as finished goods and debtors.
- **Constant assets -** Constant assets are those that are purchased and sold without any add-ons or conversions, such as liquor bought by a liquor store from a liquor manufacturer.
- **Cash equivalents -** They can be used to repay dues or purchase other assets. The most common cash equivalent assets are cash in hand and at the bank and loans given.

The current assets a company has are:

- **Inventories -** These are arguably the most important current assets that a company has as it is by the sale of its stocks that a company makes its profits. Stocks, in turn, consist of:
  - **Raw materials -** The primary purchase which is utilized to manufacture the products a company makes.
  - **Work in progress -** Goods that are in the process of manufacture but are yet to be completed.
  - **Finished goods -** The finished products manufactured by the company that are ready for sale.

Valuation of stocks

Stocks are valued at the lower of cost or net realizable value. This is to ensure that there will be no loss at the time of sale as that would have been accounted for. The common methods of valuing stocks are:

- **FIFO or first in first out -** It is assumed under this method that stocks that come in first would be sold first and those that come in last would be sold last.
- **LIFO or last in last out -** The premise on which this method is based is the opposite of FIFO. It is assumed that the goods that arrive last will be sold first. The reasoning is that customers prefer newer materials or products. It is important to ascertain the method of valuation and the accounting principles involved as stock values can easily be manipulated by changing the method of valuation.

Debtors - Most companies do not sell their products for cash but on credit and purchasers are expected to pay for the goods they have bought within an agreed period of time - 30 days or 60 days. The period of credit would vary from customer to customer and from the company to company and depends on the credit worthiness of the customer, market conditions and competition. Often customers may not pay within the agreed credit period. This may be due to laxity in credit administration or the inability of the customers to pay. Consequently, debts are classified as:

1. Those over six months, and
2. Others

These are further subdivided into;

1. Debts considered good, and
2. Debts considered bad and doubtful

If debts are likely to be bad, they must be provided for or written off. If this is not done, assets will be overstated to the extent of the bad debt. A write off is made only when there is no hope of recovery. Otherwise, a provision is made. Provisions may be specific or they may be general. When amounts are provided on certain identified debts, the provision is termed specific whereas if a provision amounting to a certain percentage of all debts is made, the provision is termed general.

Prepaid Expenses - All payments are not made when due. Many payments, such as insurance premia, rent and service costs, are made in advance for a period of time which may be 3 months, 6 months, or even a year. The portion of such expenses that relates to the next accounting period are shown as prepaid expenses in the Balance Sheet.

Cash & Bank Balances - Cash in hand in petty cash boxes, safes and balances in bank accounts are shown under this heading in the Balance Sheet.

Loans & Advances - These are loans that have been given to other corporations, individuals and employees and are repayable within a certain period of time. This also includes amounts paid in advance for the supply of goods, materials and services.

Other Current Assets - Other current assets are all amounts due that are recoverable within the next twelve months. These include claims receivable, interest due on investments and the like.

Current Liabilities - Current liabilities are amounts due that are payable within the next twelve months. These also include provisions which are amounts set aside for an expense incurred for which the bill has not been received as yet or whose cost has not been fully estimated.

Creditors - Trade creditors are those to whom the company owes money for raw materials and other articles used in the manufacture of its products. Companies usually purchase these on credit - the credit period depending on the demand for the item, the standing of the company and market practice.

Accrued Expenses - Certain expenses such as interest on bank overdrafts, telephone costs, electricity and overtime are paid after they have been incurred. This is because they fluctuate and it is not possible to either prepay or accurately anticipate these expenses. However, the expense has been incurred. To recognize this the expense incurred is estimated based on past trends and known expenses incurred and accrued on the date of the Balance Sheet.

Provisions - Provisions are amounts set aside from profits for an estimated expense or loss. Certain provisions such as depreciation and provisions for bad debts are deducted from the concerned asset itself. There are others, such as claims that may be payable, for which provisions are made. Other provisions normally seen on balance sheets are those for dividends and taxation.

Sundry Creditors - Any other amounts due are usually clubbed under the all-embracing title of sundry creditors. These include unclaimed dividends and dues payable to third parties.

3.1.3.2 Income Statement

The Profit and Loss account summarizes the activities of a company during an accounting period which may be a month, a quarter, six months, a year or longer, and the result achieved by the company. It details the income earned by the company, its cost and the resulting profit or loss. It is, in effect, the performance appraisal not only of the company but also of its management - its competence, foresight and ability to lead.

Sales - Sales include the amount received or receivable from customers arising from the sales of goods and the provision of services by a company. A sale occurs when the ownership of goods and the consequent risk relating to these goods are passed to the customer in return for consideration, usually cash. In normal circumstances the physical possession of the goods is also transferred at the same time. A sale does not occur when a company places goods at the shop of a dealer with the clear understanding that payment need be made only after the goods are sold failing which they may be returned. In such a case, the ownership and risks are not transferred to the dealer nor any consideration paid.

Companies do give trade discounts and other incentive discounts to customers to entice them to buy their products. Sales should be accounted for after deducting these discounts. However, cash discounts given for early payment are a finance expense and should be shown as an expense and not deducted from sales.

There are many companies which deduct excise duty and other levies from sales. There

are others who show this as an expense. It is preferable to deduct these from sales since the sales figures would then reflect the actual mark-up made by the company on its cost of production.

Other Income - Companies may also receive income from sources other than from the sale of their products or the provision of services. These are usually clubbed together under the heading, other income. The more common items that appear under this title are:

- **Profit from the sale of assets -** Profit from the sale of investments or assets.
- **Dividends -** Dividends earned from investments made by the company in the shares of other companies.
- **Rent -** Rent received from commercial buildings and apartments leased from the company.
- **Interest -** Interest received on deposits made and loans given to corporate and other bodies.

Raw Materials - The raw materials and other items used in the manufacture of a company's products. It is also sometimes called the cost of goods sold.

Employee Costs - The costs of employment are accounted for under this head and would include wages, salaries, bonus, gratuity, contributions made to provident and other funds, welfare expenses, and other employee related expenditure.

Operating & Other Expenses - All other costs incurred in running a company are called operating and other expenses, and include.

- **Selling expenses -** The cost of advertising, sales commissions, sales promotion expenses and other sales related expenses.
- **Administration expenses -** Rent of offices and factories, municipal taxes, stationery, telephone and telex costs, electricity charges, insurance, repairs, motor maintenance, and all other expenses incurred to run a company.
- **Others -** These include costs that are not strictly administration or selling expenses, such as donations made, losses on the sale of fixed assets or investments, miscellaneous expenditure and the like.

Interest & Finance Charges - A company has to pay interest on money it borrows. This is normally shown separately as it is a cost distinct from the normal costs incurred in running a business and would vary from company to company.

The normal borrowings that a company pays interest on are:

1. Bank overdrafts
2. Term loans taken for the purchase of machinery or construction of a factory
3. Fixed deposits from the public
4. Debentures
5. Inter-corporate loans

Depreciation - Depreciation represents the wear and tear incurred by the fixed assets of a company, i.e. the reduction in the value of fixed assets on account of usage. This is also shown separately as the depreciation charge of similar companies in the same industry will differ, depending on the age of the fixed assets and the cost at which they have been bought.

Tax - Most companies are taxed on the profits that they make. It must be remembered however that taxes are payable on the taxable income or profit and this can differ from the accounting income or profit. Taxable income is what income is according to tax law, which is different to what accounting standards consider income to be. Some income and expenditure items are excluded for tax purposes (i.e. they are not assessable or not deductible) but are considered legitimate income or expenditure for accounting purposes.

Dividends - Dividends are profits distributed to shareholders. The total profits after tax are not always distributed – a portion is often ploughed back into the company for its future growth and expansion. Companies generally pay an interim and / or final dividend. Interim dividend usually accompanies the company's interim financial statements. The final dividend is usually declared after the results for the period have been determined. The final dividend is proposed at the annual general meeting of the company and paid after the approval of the shareholders.

Transfer to Reserves - The transfer to reserves is the profit ploughed back into the company. This may be done to finance working capital, expansion, fixed assets or for some other purpose. These are revenue reserves and can be distributed to shareholders as dividends.

Contingent Liabilities - Contingent liabilities are liabilities that may arise up on the happening of an event. It is uncertain however whether the event itself may happen. This is why these are not provided for and shown as an actual liability in the balance sheet. Contingent liabilities are detailed in the Financial Statements as a note to inform the readers of possible future liabilities while arriving at an opinion about the company. The contingent liabilities one normally encounters are:

- Bills discounted with banks - These may crystallize into active liabilities if the bills are dishonoured.
- Gratuity to employees not provided for
- Claims against a company not acknowledged or accepted
- Excise claims against the company etc.

3.1.4 Schedules and Notes to the Accounts

The schedules and notes to the accounts are an integral part of the financial statements of a company and it is important that they be read along with the financial statements.

Schedules - The schedules detail pertinent information about the items of Balance Sheet and Profit & Loss Account. It also details information about sales, manufacturing costs,

administration costs, interest, and other income and expenses. This information is vital for the analysis of financial statements.

The schedules enable an investor to determine which expenses increased and seek the reasons for this. Similarly, investors would be able to find out the reasons for the increase or decrease in sales and the products that are sales leaders. The schedules even give details of stocks and sales, particulars of capacity and productions, and much other useful information.

Notes - The notes to the accounts are even more important than the schedules because it is here that very important information relating to the company is stated. Notes can effectively be divided into:

- **Accounting policies -** All companies follow certain accounting principles and these may differ from those of other entities. As a consequence, the profit earned might differ. Companies have also been known to change (normally increase) their profit by changing the accounting policies. For instance, ABC Co. Ltd.'s Annual Report stated among other things, "There has been a change in the method of accounting relating to interest on borrowings used for capital expenditure. While such interest was fully written off in the previous years, interest charges incurred during the year have been capitalized for the period upto the date from which the assets have been put to use. Accordingly, expenditure transferred to capital account includes an amount of Rs. 46.63 crores towards interest capitalized. The profit before taxes for the year after the consequential adjustments of depreciation of Rs. 0.12 crore is therefore higher by Rs. 46.51 crores than what it would have been had the previous basis been followed". This means that by changing an accounting policy ABC Co. Ltd. was able to increase its income by Rs. 46 crore. There could be similar notes on other items in the financial statements.

  The accounting policies normally detailed in the notes relate to:

  - How sales are accounted for?
  - What the research and development costs are?
  - How the gratuity liability is expensed?
  - How fixed assets are valued?
  - How depreciation is calculated?
  - How stock, including finished goods, work in progress, raw materials and consumable goods are valued?
  - How investments are stated in the balance sheet?
  - How has the foreign exchange translated?

- **Contingent liabilities -** As noted earlier, contingent liabilities that might crystallize upon the happening of an uncertain event. All contingent liabilities are detailed in the notes to the accounts and it would be wise to read these as they give valuable

insights. The more common contingent liabilities that one comes across in the financial statements of companies are:

- Outstanding guarantees.
- Outstanding letters of credit.
- Outstanding bills discounted.
- Claims against the company not acknowledged as debts.
- Claim for taxes.
- Cheques discounted.
- Uncalled liability on partly paid shares and debentures.

- **Others -** It must be appreciated that the purpose of notes to the accounts is to inform the reader more fully. Consequently, they detail all pertinent factors which affect, or will affect, the company and its results. Often as a consequence, adjustments may need to be made to the accounts to unearth the true results. The more common notes one comes across are:
  - Whether provisions for known or likely losses have been made.
  - Estimated value of contracts outstanding.
  - Interest not provided for.
  - Arrangements agreed by the company with third parties.
  - Agreement with labour.

The importance of these notes cannot be overstressed. It is imperative that investors read these carefully.

3.2 Cash Flow Statement

Complementing the balance sheet and income statement, the cash flow statement (CFS) allows investors to understand how a company's operations are running, where its money is coming from and how it is being spent.

The Structure of the CFS

The cash flow statement is distinct from the income statement and balance sheet because it does not include the amount of future incoming and outgoing cash that has been recorded on credit. Therefore, cash is not the same as net income, which, on the income statement and balance sheet, includes cash sales and sales made on credit. Cash flow is determined by looking at three components by which cash enters and leaves a company, its core operations, investing activities and financing activities.

Cash Flow From Operations

Measuring the cash inflows and outflows caused by core business operations, the operations component of cash flow reflects how much cash is generated from

a company's products or services. Generally, changes made in cash, accounts receivable, depreciation, inventory and accounts payable are reflected in cash from operations. Cash flow is calculated by making certain adjustments to net income by adding or subtracting differences in revenue, expenses and credit transactions (appearing on the balance sheet and income statement) resulting from transactions that occur from one period to the next. These adjustments are made because non-cash items are calculated into net income (income statement) and total assets and liabilities (balance sheet). So, because not all transactions involve actual cash items, many items have to be re-evaluated when calculating cash flow from operations.

For example, depreciation is not really a cash expense; it is an amount that is deducted from the total value of an asset that has previously been accounted for. That is why it is added back into net sales for calculating cash flow. The only time income from an asset is accounted for in cash flow statement calculations is when the asset is sold.

Changes in accounts receivable on the balance sheet from one accounting period to the next must also be reflected in cash flow. If accounts receivable decreases, this implies that more cash has entered the company from customers paying off their credit accounts - the amount by which accounts receivable has decreased is then added to net sales. If accounts receivable increases from one accounting period to the next, the amount of the increase must be deducted from net sales because, although the amounts represented in accounts receivable are revenue, they are not cash.

An increase in inventory, on the other hand, signals that a company has spent more money to purchase more raw materials. If the inventory was paid with cash, the increase in the value of inventory is deducted from net sales. A decrease in inventory would be added to net sales. If inventory was purchased on credit, an increase in accounts payable would occur on the balance sheet, and the amount of the increase from one year to the other would be added to net sales.

The same logic holds true for taxes payable, salaries payable and prepaid insurance. If something has been paid off, then the difference in the value owed from one year to the next has to be subtracted from net income. If there is an amount that is still owed, then any differences will have to be added to net earnings.

Cash Flow From Investing

Changes in equipment, assets or investments relate to cash from investing. Usually cash changes from investing are a "cash out" item, because cash is used to buy new equipment, buildings or short-term assets such as marketable securities. However, when a company divests of an asset, the transaction is considered "cash in" for calculating cash from investing.

Cash Flow From Financing

Changes in debt, loans or dividends are accounted for in cash from financing. Changes in cash from financing are "cash in" when capital is raised, and they're "cash out" when dividends are paid. Thus, if a company issues a bond to the public, the company receives cash financing; however, when interest is paid to bondholders, the company is reducing its cash.

A company can use a cash flow statement to predict future cash flow, which helps with matters in budgeting. For investors, the cash flow reflects a company's financial health: basically, the more cash available for business operations, the better. However, this is not a hard and fast rule. Sometimes a negative cash flow results from a company's growth strategy in the form of expanding its operations.

By adjusting earnings, revenues, assets and liabilities, the investor can get a very clear picture of what some people consider the most important aspect of a company: how much cash it generates and particularly, how much of that cash stems from core operations.

3.3 Financial Statement Analysis and Forensic Accounting

A comprehensive financial statement analysis provides insights into a firm's performance and/or standing in the areas of liquidity, leverage, operating efficiency and profitability. A complete analysis involves both time series and cross-sectional perspectives. Time series analysis examines trends using the firm's own performance as a benchmark. Cross sectional analysis augments the process by using external performance benchmarks (Industry or peers) for comparison purposes.

3.4 Comparative and Common-size Financial Statements

As seen in the previous NCFM module[4], we often use comparative financial statements in order to compare different financial ratios of a firm with the industry averages and other peers in the industry whereas we use common-size financial statements in order to compare performance of a firm or two firms over time. Financial ratios in isolation mean nothing. We need to observe them change over time or compare financial ratios of a cross section of firms in order to make sense of them.

3.5 Financial Ratios

To find the data used in the examples in this section, please see the XYZ Technologies Limited's financial statements given earlier.

Liquidity Measurement Ratios

The first ratios we'll take a look at are the liquidity ratios. Liquidity ratios attempt to measure a company's ability to pay off its short-term debt obligations. This is done by comparing a company's most liquid assets (or, those that can be easily converted to cash) and its short-term liabilities.

[4] Please see NCFM's Investment Analysis and Portfolio Management module for more details.

In general, the greater the coverage of liquid assets to short-term liabilities, the better it is, since it is a clear signal that a company can pay debts that are going to become due in the near future and it can still fund its on-going operations. On the other hand, a company with a low coverage rate should raise a red flag for the investors as it may be a sign that the company will have difficulty meeting running its operations, as well as meeting its debt obligations.

The biggest difference between each ratio is the type of assets used in the calculation. While each ratio includes current assets, the more conservative ratios will exclude some current assets as they aren't as easily converted to cash. The ratios that we'll look at are the current, quick and cash ratios and we will also go over the cash conversion cycle, which goes into how the company turns its inventory into cash.

- **Current Ratio**

The current ratio is a popular financial ratio used to test a company's liquidity (also referred to as its current or working capital position) by deriving the proportion of current assets available to cover current liabilities. The concept behind this ratio is to ascertain whether a company's short-term assets (cash, cash equivalents, marketable securities, receivables and inventory) are readily available to pay off its short-term liabilities. In theory, the higher the current ratio, the better.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ'S current assets amounted to 13,041 (balance sheet), which is the numerator; while current liabilities amounted to 4030 (balance sheet), which is the denominator. By dividing, the equation gives us a current ratio of 3.24 which can be considered very healthy.

The current ratio is used extensively in financial reporting. However, while easy to understand, it can be misleading in both a positive and negative sense - i.e., a high current ratio is not necessarily good, and a low current ratio is not necessarily bad (see chart below).

Here's why: contrary to popular perception, the ubiquitous current ratio, as an indicator of liquidity, is flawed because it is conceptually based on the liquidation of all of a company's current assets to meet all of its current liabilities. In reality, this is not likely to occur. Investors have to look at a company as a going concern. It's the time it takes to convert a company's working capital assets into cash to pay its current obligations that is the key to its liquidity. In a word, the current ratio can be "misleading."

A simplistic, but accurate, comparison of two companies' current position will illustrate the weakness of relying on the current ratio or a working capital number (current assets minus current liabilities) as a sole indicator of liquidity (amounts in Rs. crs.) :

	ABC	BCD
Current Assets	600	300
Current Liabilities	300	300
Working Capital	300	0
Current Ratio	2	1

Company ABC looks like an easy winner in a liquidity contest. It has an ample margin of current assets over current liabilities, a seemingly good current ratio and working capital of Rs. 300. Company has no current asset/liability margin of safety, a weak current ratio, and no working capital.

However, to prove the point, what if: (1) both companies' current liabilities have an average payment period of 30 days; (2) Company ABC needs six months (180 days) to collect its account receivables and its inventory turns over just once a year (365 days); and (3) Company is paid cash by its customers, and its inventory turns over 24 times a year (every 15 days). In this contrived example, company ABC is very *illiquid* and would not be able to operate under the conditions described. Its bills are coming due faster than its generation of cash. You can't pay bills with working capital; you pay bills with cash! Company's 's seemingly tight current position is, in effect, much more liquid because of its quicker cash conversion. When looking at the current ratio, it is important that a company's current assets can cover its current liabilities; however, investors should be aware that this is not the whole story on company liquidity. Try to understand the types of current assets the company has and how quickly these can be converted into cash to meet current liabilities. This important perspective can be seen through the cash conversion cycle. By digging deeper into the current assets, you will gain a greater understanding of a company's true liquidity.

- **Quick Ratio**

The quick ratio - aka the quick assets ratio or the acid-test ratio - is a liquidity indicator that further refines the current ratio by measuring the amount of the most liquid current assets there are to cover current liabilities. The quick ratio is more conservative than the current ratio because it excludes inventory and other current assets, which are more difficult to turn into cash. Therefore, a higher ratio means a more liquid current position.

$$\text{Quick Ratio} = \frac{\text{Cash \& Equivalents} + \text{Short} - \text{term Investments} + \text{Accounts Re ceivables}}{\text{Current Liabilities}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ'S quick assets amounted to 13,041 (balance sheet); while current liabilities amounted to 4,030 (balance sheet). By dividing, the equation gives us a quick ratio of 3.24. XYZ being in the services sector does not have any inventory on its balance sheet and this quick ratio and current ratio come out to be the same.

Some presentations of the quick ratio calculate quick assets (the formula's numerator) by simply subtracting the inventory figure from the total current assets figure. The assumption is that by excluding relatively less-liquid (harder to turn into cash) inventory, the remaining current assets are all of the more-liquid variety. Generally, this is close to the truth, but not always. In some companies, restricted cash, prepaid expenses and deferred income taxes do not pass the test of truly liquid assets. Thus, using the shortcut approach artificially overstates more liquid assets and inflates its quick ratio.

The quick ratio is a more conservative measure of liquidity than the current ratio as it removes inventory from the current assets used in the ratio's formula. By excluding inventory, the quick ratio focuses on the more-liquid assets of a company. The basics and use of this ratio are similar to the current ratio in that it gives users an idea of the ability of a company to meet its short-term liabilities with its short-term assets. Another beneficial use is to compare the quick ratio with the current ratio. If the current ratio is significantly higher, it is a clear indication that the company's current assets are dependent on inventory.

While considered more stringent than the current ratio, the quick ratio, because of its accounts receivable component, suffers from the same deficiencies as the current ratio - albeit somewhat less. Both the quick and the current ratios assume a liquidation of accounts receivable and inventory as the basis for measuring liquidity. While theoretically feasible, as a going concern a company must focus on the time it takes to convert its working capital assets to cash - that is the true measure of liquidity. Thus, if accounts receivable, as a component of the quick ratio, have, let's say, a conversion time of several months rather than several days, the "quickness" attribute of this ratio is questionable.

Investors need to be aware that the conventional wisdom regarding both the current and quick ratios as indicators of a company's liquidity can be misleading.

- **Cash Ratio**

The cash ratio is an indicator of a company's liquidity that further refines both the current ratio and the quick ratio by measuring the amount of cash; cash equivalents or invested funds there are in current assets to cover current liabilities.

$$\text{Quick Ratio} = \frac{\text{Cash} + \text{Cash \& Equivalents} + \text{Invested Funds}}{\text{Current Liabilities}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ'S cash assets amounted to 9,797 (balance sheet); while current liabilities amounted to 4,030 (balance sheet). By dividing, the equation gives us a cash ratio of 2.43.

The cash ratio is the most stringent and conservative of the three short-term liquidity ratios (current, quick and cash). It only looks at the most liquid short-term assets of the company,

which are those that can be most easily used to pay off current obligations. It also ignores inventory and receivables, as there are no assurances that these two accounts can be converted to cash in a timely matter to meet current liabilities. Very few companies will have enough cash and cash equivalents to fully cover current liabilities, which isn't necessarily a bad thing, so don't focus on this ratio being above 1:1.

The cash ratio is seldom used in financial reporting or by analysts in the fundamental analysis of a company. It is not realistic for a company to purposefully maintain high levels of cash assets to cover current liabilities. The reason being that it's often seen as poor asset utilization for a company to hold large amounts of cash on its balance sheet, as this money could be returned to shareholders or used elsewhere to generate higher returns. While providing an interesting liquidity perspective, the usefulness of this ratio is limited.

Profitability Indicator Ratios

These ratios, much like the operational performance ratios, give users a good understanding of how well the company utilized its resources in generating profit and shareholder value. The long-term profitability of a company is vital for both the survivability of the company as well as the benefit received by shareholders. It is these ratios that can give insight into the all-important "profit".

We look at four important profit margins, which display the amount of profit a company generates on its sales at the different stages of an income statement. We'll also show you how to calculate the effective tax rate of a company. The last three ratios covered in this section - Return on Assets, Return on Equity and Return on Capital Employed - detail how effective a company is at generating income from its resources.

- **Profit Margin Analysis**

In the income statement, there are four levels of profit or profit margins – gross profit, operating profit, pre-tax profit and net profit. The term "margin" can apply to the absolute number for a given profit level and/or the number as a percentage of net sales/revenues. Profit margin analysis uses the percentage calculation to provide a comprehensive measure of a company's profitability on a historical basis (3-5 years) and in comparison to peer companies and industry benchmarks. Basically, it is the amount of profit (at the gross, operating, pre-tax or net income level) generated by the company as a percentage of the sales generated. The objective of margin analysis is to detect consistency or positive/negative trends in a company's earnings. Positive profit margin analysis translates into positive investment quality. To a large degree, it is the quality, and growth, of a company's earnings that drive its stock price.

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Net Sales}}$$

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Net Sales}}$$

$$\text{Pretax Profit Margin} = \frac{\text{Pretax Profit}}{\text{Net Sales}}$$

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Net Sales}}$$

All the amounts in these ratios are found in the income statement. As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had net sales, or revenue, of 21,140, which is the denominator in all of the profit margin ratios. The equations give us the percentage profit margins as indicated.

Operating Profit Margin	35%
Pre-tax Profit Margin	31%
Net Profit Margin	23%

Second, income statements in the multi-step format clearly identify the four profit levels. However, with the single-step format the investor must calculate the gross profit and operating profit margin numbers. To obtain the gross profit amount, simply subtract the cost of sales (cost of goods sold) from net sales/revenues. The operating profit amount is obtained by subtracting the sum of the company's operating expenses from the gross profit amount. Generally, operating expenses would include such account captions as 'selling', 'marketing and administrative', 'research and development', 'depreciation and amortization', 'rental properties' etc.

Third, investors need to understand that the absolute numbers in the income statement don't tell us very much, which is why we must look to margin analysis to discern a company's true profitability. These ratios help us to keep score, as measured over time, of management's ability to manage costs and expenses and generate profits. The success, or lack thereof, of this important management function is what determines a company's profitability. A large growth in sales will do little for a company's earnings if costs and expenses grow disproportionately.
Lastly, the profit margin percentage for all the levels of income can easily be translated into a handy metric used frequently by analysts and often mentioned in investment literature. The ratio's percentage represents the number of paises there are in each rupee worth of sales. For example, using XYZ'S numbers, in every sales rupee for the company in 2010, there's roughly 35, 31, and 23 paisa of operating, pre-tax, and net income, respectively.
Let's look at each of the profit margin ratios individually:

- **Gross Profit Margin**

A company's cost of sales, or cost of goods sold, represents the expense related to labour, raw materials and manufacturing overhead involved in its production process. This expense is deducted from the company's net sales/revenue, which results in a company's first level

of profit or gross profit. The gross profit margin is used to analyse how efficiently a company is using its raw materials, labour and manufacturing-related fixed assets to generate profits. A higher margin percentage is a favourable profit indicator. Industry characteristics of raw material costs, particularly as these relate to the stability or lack thereof, have a major effect on a company's gross margin. Generally, management cannot exercise complete control over such costs. Companies without a production process (ex., retailers and service businesses) don't have a cost of sales exactly. In these instances, the expense is recorded as a "cost of merchandise" and a "cost of services", respectively. With this type of company, the gross profit margin does not carry the same weight as a producer type company.

- **Operating Profit Margin**

By subtracting selling, general and administrative, or operating expenses from a company's gross profit number, we get operating income. Management has much more control over operating expenses than its cost of sales outlays. Thus, investors need to scrutinize the operating profit margin carefully. Positive and negative trends in this ratio are, for the most part, directly attributable to management decisions. A company's operating income figure is often the preferred metric (deemed to be more reliable) of investment analysts, versus its net income figure, for making inter-company comparisons and financial projections.

- **Pre-tax Profit Margin**

Again, many investment analysts prefer to use a pre-tax income number for reasons similar to those mentioned for operating income. In this case a company has access to a variety of tax-management techniques, which allow it to manipulate the timing and magnitude of its taxable income.

- **Net Profit Margin**

Often referred to simply as a company's profit margin, the so-called bottom line is the most often mentioned when discussing a company's profitability. While undeniably an important number, investors can easily see from a complete profit margin analysis that there are several income and expense operating elements in an income statement that determine a net profit margin. It behoves investors to take a comprehensive look at a company's profit margins on a systematic basis.

- **Effective Tax Rate**

This ratio is a measurement of a company's tax rate, which is calculated by comparing its income tax expense to its pre-tax income. This amount will often differ from the company's stated jurisdictional rate due to many accounting factors, including foreign exchange provisions. This effective tax rate gives a good understanding of the tax rate the company faces.

$$\text{Effective Tax Rate} = \frac{\text{Income Tax Expense}}{\text{Pretax Income}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had a provision for income taxes in its income statement of 1,717 (income statement) and pre-tax income of 7,520 (income statement). By dividing, the equation gives us an effective tax rate of 23% for FY 2010.

The variances in this percentage can have a material effect on the net-income figure. Peer company comparisons of net profit margins can be problematic as a result of the impact of the effective tax rate on net profit margins. The same can be said of year-over-year comparisons for the same company. This circumstance is one of the reasons some financial analysts prefer to use the operating or pre-tax profit figures instead of the net profit number for profitability ratio calculation purposes.

One could argue that any event that improves a company's net profit margin is a good one. However, from a quality of earnings perspective, tax management manoeuvrings (though may be legitimate) are less desirable than straight-forward positive operational results.

Tax provision volatility of a company's finances makes an objective judgment of its true or operational net profit performance difficult to determine. Techniques to lessen the tax burden are practiced, to one degree or another, by many companies. Nevertheless, a relatively stable effective tax rate percentage and resulting net profit margin, would seem to indicate that the company's operational managers are more responsible for a company's profitability than the company's tax accountants.

- **Return On Assets**

This ratio indicates how profitable a company is relative to its total assets. The return on assets (ROA) ratio illustrates how well management is employing the company's total assets to make a profit. The higher the return, the more efficient management is in utilizing its asset base. The ROA ratio is calculated by comparing net income to average total assets, and is expressed as a percentage.

$$\text{ROA} = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had net income of 5,803 (income statement), and average total assets of 19,922 (balance sheet). By dividing, the equation gives us an ROA of 29% for FY 2010. The need for investment in current and non-current assets varies greatly among companies. Capital-intensive businesses (with a large investment in fixed assets) are going to be more asset heavy than technology or service businesses. In the case of capital-intensive businesses, which have to carry a relatively large

asset base, will calculate their ROA based on a large number in the denominator of this ratio. Conversely, non-capital-intensive businesses (with a small investment in fixed assets) will be generally favoured with a relatively high ROA because of a low denominator number.

It is precisely because businesses require different-sized asset bases that investors need to think about how they use the ROA ratio. For the most part, the ROA measurement should be used historically for the company being analysed. If peer company comparisons are made, it is imperative that the companies being reviewed are similar in product line and business type. Simply being categorised in the same industry will not automatically make a company comparable. As a rule of thumb, investment professionals like to see a company's ROA come in at no less than 5%. Of course, there are exceptions to this rule. An important one would apply to banks, which typically have a lower ROA.

- **Return On Equity**

This ratio indicates how profitable a company is by comparing its net income to its average shareholders' equity. The return on equity ratio (ROE) measures how much the shareholders earned for their investment in the company. The higher the ratio percentage, the more efficient management is in utilizing its equity base and the better return is to investors.

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average Shareholders' Equity}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had net income of 4,845 (income statement), and average shareholders' equity of 19,922 (balance sheet). By dividing, the equation gives us an ROE of 24.3% for FY 2010. XYZ on account of being a debt free company has its ROE equal to ROA. If a company has issued preferred stock, investors wishing to see the return on just common equity may modify the formula by subtracting the preferred dividends, which are not paid to common shareholders, from net income and reducing shareholders' equity by the outstanding amount of preferred equity.

Widely used by investors, the ROE ratio is an important measure of a company's earnings performance. The ROE tells common shareholders how effectively their money is being employed. Company peers and industry and overall market comparisons are appropriate; however, it should be recognized that there are variations in ROEs among some types of businesses. In general, financial analysts consider return on equity ratios in the 15-20% range as representing attractive levels of investment quality.

While highly regarded as a profitability indicator, the ROE metric does have a recognized weakness. Investors need to be aware that a disproportionate amount of debt in a company's capital structure would translate into a smaller equity base. Thus, a small amount of net income (the numerator) could still produce a high ROE off a modest equity base (the denominator).

For example, let's reconfigure XYZ'S debt and equity numbers to illustrate this circumstance. If we reduce the company's equity amount by Rs. 9,922 crores and increase its long-term debt by a corresponding amount, the reconfigured debt-equity relationship will be (figures in Rs. crores) 9,922 and 10,000, respectively. XYZ'S financial position is obviously much more highly leveraged, i.e., carrying a lot more debt. However, its ROE would now register a whopping 58% (5,803 ÷ 10,000), which is quite an improvement over the 29% ROE of the almost debt-free FY 2010 position of XYZ indicated above. Of course, that improvement in XYZ'S profitability, as measured by its ROE, comes with a price...a lot more debt and thus a lot more risk.

The lesson here for investors is that they cannot look at a company's return on equity in isolation. A high or low ROE needs to be interpreted in the context of a company's debt-equity relationship. The answer to this analytical dilemma can be found by using the return on capital employed (ROCE) ratio.

- **Return On Capital Employed**

The return on capital employed (ROCE) ratio, expressed as a percentage, complements the return on equity (ROE) ratio by adding a company's debt liabilities, or funded debt, to equity to reflect a company's total "capital employed". This measure narrows the focus to gain a better understanding of a company's ability to generate returns from its available capital base. By comparing net income to the sum of a company's debt and equity capital, investors can get a clear picture of how the use of leverage impacts a company's profitability. Financial analysts consider the ROCE measurement to be a more comprehensive profitability indicator because it gauges management's ability to generate earnings from a company's total pool of capital.

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had net income of 5,803 (income statement). The company's average short-term and long-term borrowings were 0 and the average shareholders' equity was 19,922 (all the necessary figures are in the 2009 and 2010 balance sheets), the sum of which, 19,922, is the capital employed. By dividing, the equation gives us an ROCE of 29% for FY 2010.

Often, financial analysts will use operating income (earnings before interest and taxes or EBIT) as the numerator. There are various takes on what should constitute the debt element in the ROCE equation, which can be quite confusing.

Our suggestion is to stick with debt liabilities that represent interest-bearing, documented credit obligations (short-term borrowings, current portion of long-term debt, and long-term debt) as the debt capital in the formula.

Debt Ratios

These ratios give users a general idea of the company's overall debt load as well as its mix of equity and debt. Debt ratios can be used to determine the overall level of financial risk a company and its shareholders face. In general, the greater the amount of debt held by a company the greater the financial risk of bankruptcy. The ratios covered in this section include the debt ratio, which is gives a general idea of a company's financial leverage as does the debt-to-equity ratio. The capitalization ratio details the mix of debt and equity while the interest coverage ratio and the cash flow to debt ratio show how well a company can meet its obligations.

Overview Of Debt

Before discussing the various financial debt ratios, we need to clear up the terminology used with "debt" as this concept relates to financial statement presentations. In addition, the debt-related topics of "funded debt" and credit ratings are discussed below.

There are two types of liabilities - operational and debt. The former includes balance sheet accounts, such as accounts payable, accrued expenses, taxes payable, pension obligations, etc. The latter includes notes payable and other short-term borrowings, the current portion of long-term borrowings, and long-term borrowings. Often times, in investment literature, "debt" is used synonymously with total liabilities. In other instances, it only refers to a company's indebtedness.

The debt ratios that are explained herein are those that are most commonly used. However, what companies, financial analysts and investment research services use as components to calculate these ratios is far from standardized.

In general, debt analysis can be broken down into three categories, or interpretations: liberal, moderate and conservative.

• **Liberal** - This approach tends to minimize the amount of debt. It includes only long-term debt as it is recorded in the balance sheet under noncurrent liabilities.

• **Moderate** - This approach includes current borrowings (notes payable) and the current portion of long-term debt, which appear in the balance sheet's current liabilities; and of course, the long-term debt. In addition, redeemable preferred stock, because of its debt-like quality is considered to be debt. Lastly, as a general rule, two-thirds (roughly one-third goes to interest expense) of the outstanding balance of operating leases, which do not appear in the balance sheet, are considered debt principal. The relevant figure will be found in the notes to financial statements and identified as "future minimum lease payments required under operating leases that have initial or remaining non-cancelable lease terms in excess of one year."

• **Conservative** - This approach includes all the items used in the moderate interpretation of debt, as well as such non-current operational liabilities such as deferred taxes, pension liabilities and other post-retirement employee benefits.

Investors may want to look to the middle ground when deciding what to include in a company's debt position. With the exception of unfunded pension liabilities, a company's non-current operational liabilities represent obligations that will be around, at one level or another, forever - at least until the company ceases to be a going concern and is liquidated. Also, unlike debt, there are no fixed payments or interest expenses associated with non-current operational liabilities. In other words, it is more meaningful for investors to view a company's indebtedness and obligations through the company as a going concern, and therefore, to use the moderate approach to defining debt in their leverage calculations. Funded debt is a term that is seldom used in financial reporting. Technically, funded debt refers to that portion of a company's debt comprised, generally, of long-term, fixed maturity, contractual borrowings. No matter how problematic a company's financial condition, holders of these obligations, typically bonds, cannot demand payment as long as the company pays the interest on its funded debt. In contrast, long-term bank debt is usually subject to acceleration clauses and/or restrictive covenants that allow a lender to call its loan, i.e., demand its immediate payment. From an investor's perspective, the greater the percentage of funded debt in the company's total debt, the better.

Lastly, credit ratings are formal risk evaluations by credit agencies such as CRISIL, ICRA, CARE, and Fitch - of a company's ability to repay principal and interest on its debt obligations, principally bonds and commercial paper. Obviously, investors in both bonds and stocks follow these ratings rather closely as indicators of a company's investment quality. If the company's credit ratings are not mentioned in their financial reporting, it's easy to obtain them from the company's investor relations department.

- **The Debt Ratio**

The debt ratio compares a company's total debt to its total assets, which is used to gain a general idea as to the amount of leverage being used by a company. A low percentage means that the company is less dependent on leverage, i.e., money borrowed from and/or owed to others. The lower the percentage, the less leverage a company is using and the stronger its equity position. In general, the higher the ratio, the more risk that company is considered to have taken on.

$$\text{Debt Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had total liabilities of 1,995 (balance sheet) and total assets of 22,036 (balance sheet). By dividing, the equation provides

the company with a low leverage as measured by the debt ratio of 9%. The easy-to-calculate debt ratio is helpful to investors looking for a quick take on a company's leverage. The debt ratio gives users a quick measure of the amount of debt that the company has on its balance sheets compared to its assets. The more debt compared to assets a company has, which is signalled by a high debt ratio, the more leveraged it is and the riskier it is considered to be. Generally, large, well-established companies can push the liability component of their balance sheet structure to higher percentages without getting into trouble. However, one thing to note with this ratio: it isn't a pure measure of a company's debt (or indebtedness), as it also includes operational liabilities, such as accounts payable and taxes payable. Companies use these operational liabilities as going concerns to fund the day-to-day operations of the business and aren't really "debts" in the leverage sense of this ratio. Basically, even if you took the same company and had one version with zero financial debt and another version with substantial financial debt, these operational liabilities would still be there, which in some sense can muddle this ratio. The use of leverage, as displayed by the debt ratio, can be a double-edged sword for companies. If the company manages to generate returns above their cost of capital, investors will benefit. However, with the added risk of the debt on its books, a company can be easily hurt by this leverage if it is unable to generate returns above the cost of capital. Basically, any gains or losses are magnified by the use of leverage in the company's capital structure.

- **Debt-Equity Ratio**

The debt-equity ratio is another leverage ratio that compares a company's total liabilities to its total shareholders' equity. This is a measurement of how much suppliers, lenders, creditors and obligors have committed to the company versus what the shareholders have committed. To a large degree, the debt-equity ratio provides another vantage point on a company's leverage position, in this case, comparing total liabilities to shareholders' equity, as opposed to total assets in the debt ratio. Similar to the debt ratio, a lower the percentage means that a company is using less leverage and has a stronger equity position.

$$\text{Debt} - \text{Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Shareholders Equity}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had total liabilities of 1,995 (balance sheet) and total shareholders' equity of 22,306 (balance sheet). By dividing, the equation provides the company with a relatively low percentage of leverage as measured by the debt-equity ratio at 9%. A conservative variation of this ratio, which is seldom seen, involves reducing a company's equity position by its intangible assets to arrive at a tangible equity, or tangible net worth, figure. Companies with a large amount of purchased goodwill form heavy acquisition activity can end up with a negative equity position. The debt-equity ratio appears frequently in investment literature. However, like the debt ratio, this ratio is not

a pure measurement of a company's debt because it includes operational liabilities in total liabilities. Nevertheless, this easy-to-calculate ratio provides a general indication of a company's equity-liability relationship and is helpful to investors looking for a quick take on a company's leverage. Generally, large, well-established companies can push the liability component of their balance sheet structure to higher percentages without getting into trouble.

- **Capitalization Ratio**

The capitalization ratio measures the debt component of a company's capital structure, or capitalization (i.e., the sum of long-term debt liabilities and shareholders' equity) to support a company's operations and growth. Long-term debt is divided by the sum of long-term debt and shareholders' equity. This ratio is considered to be one of the more meaningful of the "debt" ratios – it delivers the key insight into a company's use of leverage. There is no right amount of debt. Leverage varies according to industries, a company's line of business and its stage of development. Nevertheless, common sense tells us that low debt and high equity levels in the capitalization ratio indicate investment quality.

$$\text{Capitalization Ratio} = \frac{\text{Long term Debt}}{\text{Long term Debt + Shareholders' Equity}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had total long-term debt of 0 (balance sheet), and total long-term debt and shareholders' equity (i.e., its capitalization) of 22,036 (balance sheet). By dividing, the equation provides the company with a zero leverage as measured by the capitalization ratio. A company's capitalization (not to be confused with its market capitalization) is the term used to describe the makeup of a company's permanent or long-term capital, which consists of both long-term debt and shareholders' equity. A low level of debt and a healthy proportion of equity in a company's capital structure is an indication of financial fitness.

Prudent use of leverage (debt) increases the financial resources available to a company for growth and expansion. It assumes that management can earn more on borrowed funds than it pays in interest expense and fees on these funds. However, successful this formula may seem, it does require a company to maintain a solid record of complying with its various borrowing commitments.

A company considered too highly leveraged (too much debt) may find its freedom of action restricted by its creditors and/or have its profitability hurt by high interest costs. Of course, the worst of all scenarios is having trouble meeting operating and debt liabilities on time and surviving adverse economic conditions. Lastly, a company in a highly competitive business, if hobbled by high debt, will find its competitors taking advantage of its problems to grab more market share. As mentioned previously, the capitalization ratio is one of the more meaningful debt ratios because it focuses on the relationship of debt liabilities as a component of a company's total capital base, which is the capital mobilized by shareholders and lenders.

- **Interest Coverage Ratio**

The interest coverage ratio is used to determine how easily a company can pay interest expenses on outstanding debt. The ratio is calculated by dividing a company's earnings before interest and taxes (EBIT) by the company's interest expenses for the same period. The lower the ratio, the more the company is burdened by debt expense. When a company's interest coverage ratio is only 1.5 or lower, its ability to meet interest expenses may be questionable.

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest Expenses}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had earnings before interest and taxes (operating income) of 7,520 (income statement), and total interest expense of 0 (income statement). This equation provides the company with an Infinite margin of safety due to lack of leverage. The ability to stay current with interest payment obligations is absolutely critical for a company as a going concern. While the non-payment of debt principal is a seriously negative condition, a company finding itself in financial/operational difficulties can stay alive for quite some time as long as it is able to service its interest expenses. In a more positive sense, prudent borrowing makes sense for most companies, but the operative word here is "prudent." Interest expenses affect a company's profitability, so the cost-benefit analysis dictates that borrowing money to fund a company's assets has to have a positive effect. An ample interest coverage ratio would be an indicator of this circumstance, as well as indicating substantial additional debt capacity. Obviously, in this category of investment quality, XYZ would go to the head of the class.

- **Cash Flow To Debt Ratio**

This coverage ratio compares a company's operating cash flow to its total debt, which, for purposes of this ratio, is defined as the sum of short-term borrowings, the current portion of long-term debt and long-term debt. This ratio provides an indication of a company's ability to cover total debt with its yearly cash flow from operations. The higher the ratio, the better is the company's ability to carry its total debt.

$$\text{Cash Flow to Debt Ratio} = \frac{\text{Operating Cash Flow}}{\text{Total Debt}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had net cash provided by operating activities (operating cash flow as recorded in the statement of cash flows) of 5,876 (cash flow statement), and total debt of 0 (balance sheet). By dividing, the equation provides the company with infinite margin of debt coverage. A more conservative cash flow figure calculation in the numerator would use a company's free cash flow (operating cash flow minus the amount of cash used for capital expenditures).

A more conservative total debt figure would include, in addition to short-term borrowings, current portion of long-term debt, long-term debt, redeemable preferred stock and two-thirds of the principal of non-cancel-able operating leases. In the case of XYZ, their debt load is nil so the resulting cash flow to debt ratio percentage is off the chart. In this instance, this circumstance would indicate that the company has ample capacity to borrow a significant amount of money, if it chose to do so, as opposed to indicating its debt coverage capacity. Under more typical circumstances, a high double-digit percentage ratio would be a sign of financial strength, while a low percentage ratio could be a negative sign that indicates too much debt or weak cash flow generation. It is important to investigate the larger factor behind a low ratio. To do this, compare the company's current cash flow to debt ratio to its historic level in order to parse out trends or warning signs.

Operating Performance Ratios

The next series of ratios we'll look at are the operating performance ratios. Each of these ratios have differing inputs and measure different segments of a company's overall operational performance, but the ratios do give users insight into the company's performance and management during the period being measured. These ratios look at how well a company turns its assets into revenue as well as how efficiently a company converts its sales into cash. Basically, these ratios look at how efficiently and effectively a company is using its resources to generate sales and increase shareholder value. In general, the better these ratios are, the better it is for shareholders.

In this section, we'll look at the fixed-asset turnover ratio and the sales/revenue per employee ratio, which look at how well the company uses its fixed assets and employees to generate sales.

- **Fixed-Asset Turnover**

This ratio is a rough measure of the productivity of a company's fixed assets (property, plant and equipment or PP&E) with respect to generating sales. For most companies, their investment in fixed assets represents the single largest component of their total assets. This annual turnover ratio is designed to reflect a company's efficiency in managing these significant assets. Simply put, the higher the yearly turnover rate, the better.

$$\text{Fixed} - \text{Asset Turnover Ratio} = \frac{\text{Net Sales}}{\text{Property, Plant \& Equipment}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had net sales, or revenue, of (income statement) and average fixed assets, or PP&E, of 2,342 (balance sheet - the average of yearend 2009 and 2010 PP&E). By dividing, the equation gives us a fixed-asset turnover rate for FY 2010 of 5.6. Instead of using fixed assets, some asset-turnover ratios would use total assets. We prefer to focus on the former because, as a significant component in the balance

sheet, it represents a multiplicity of management decisions on capital expenditures. Thus, this capital investment, and more importantly, its results, is a better performance indicator than that evidenced in total asset turnover. There is no exact number that determines whether a company is doing a good job of generating revenue from its investment in fixed assets. This makes it important to compare the most recent ratio to both the historical levels of the company along with peer company and/or industry averages. Before putting too much faith into this ratio, it's important to determine the type of company that you are using the ratio on because a company's investment in fixed assets is very much linked to the requirements of the industry in which it conducts its business. Fixed assets vary greatly among companies. For example, an IT company, like XYZ, has less of a fixed-asset base than a heavy manufacturer like BHEL. Obviously, the fixed-asset ratio for XYZ will have less relevance than that for BHEL.

- **Sales/Revenue per Employee**

As a gauge of personnel productivity, this indicator simply measures the amount of rupee sales, or revenue, generated per employee. The higher the figure the better. Here again, labour-intensive businesses (ex. mass market retailers) will be less productive in this metric than a high-tech, high product-value manufacturer.

$$\text{Sales Per Employee} = \frac{\text{Net Sales}}{\text{Average Number of Employees}}$$

As of March 31, 2010, with amounts expressed in Rs. crores, XYZ had generated 22,098 in net sales with an average personnel component for the year of approximately 85,000 employees. The sales, or revenue, figure is the numerator (income statement), and the average number of employees for the year is the denominator (annual report) and Sales Per Employee come out to be Rs. 2,500,000.

An 'Earnings per Employee' ratio could also be calculated using net income (as opposed to net sales) in the numerator.

Industry and product-line characteristics will influence this indicator of employee productivity. Tracking this figure historically and comparing it to peer-group companies will make this quantitative amount more meaningful in an analytical sense.

3.6 Du-Pont Analysis

The DuPont ratio can be used as a compass in the process of assessing financial performance of the company by directing the analyst toward significant areas of strength and weakness evident in the financial statements.

The DuPont ratio is calculated as follows:

$$ROE = \left(\frac{\text{Net Income}}{\text{Sales}}\right) * \left(\frac{\text{Sales}}{\text{Average Assets}}\right) * \left(\frac{\text{Average Assets}}{\text{Avenge Equity}}\right)$$

The ratio provides measures in three of the four key areas of analysis, each representing a compass bearing, pointing the way to the next stage of the investigation.

The DuPont Ratio Decomposition

The DuPont ratio is a good place to begin a financial statement analysis because it measures the return on equity (ROE). A for-profit business exists to create wealth for its owner(s). ROE is, therefore, arguably the most important of the key ratios, since it indicates the rate at which owner wealth is increasing.

The three components of the DuPont ratio, as represented in equation, cover the areas of profitability, operating efficiency and leverage.

- **Profitability: Net Profit Margin**

Profitability ratios measure the rate at which either sales or capital is converted into profits at different levels of the operation. As we have seen, the most common are gross, operating and net profitability, which describe performance at different activity levels. Of the three, net profitability is the most comprehensive since it uses the bottom line net income in its measure.

The net profitability for XYZ Technologies in 2010 is:

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Sales}}$$

$$= \frac{5803 - 958}{21140}$$

= 22.92%

A proper analysis of this ratio would include at least three to five years of trend and cross-sectional comparison data. The cross sectional comparison can be drawn from a variety of sources.

- **Asset Utilization: Total Asset Turnover**

Turnover or efficiency ratios are important because they indicate how well the assets of a firm are used to generate sales and/or cash. While profitability is important, it doesn't always provide the complete picture of how well a company provides a product or service. A company can be very profitable, but not too efficient. Profitability is based upon accounting measures of sales revenue and costs. Such measures are generated using the matching principle of accounting, which records revenue when earned and expenses when incurred. Hence, the

gross profit margin measures the difference between sales revenue and the cost of goods actually sold during the accounting period. The goods sold may be entirely different from the goods produced during that same period. Goods produced but not sold will show up as inventory assets at the end of the year. A firm with abnormally large inventory balances is not performing effectively, and the purpose of efficiency ratios is to reveal that fact.

The total asset turnover (TAT) ratio measures the degree to which a firm generates sales with its total asset base. It is important to use average assets in the denominator to eliminate bias in the ratio calculation. Financial ratio bias is commonly present when combining items from both the balance sheet and income statement. For example, TAT uses income statement sales in its numerator and balance sheet assets in the denominator. Income statement items are flow variables measured over a time interval, while balance sheet items are measured at a fixed point in time. In cases where the firm has been involved in major change, such as an expansion project, balance sheet measures taken at the end of the year may misrepresent the amount of assets available and/or in use over the course of the year. Taking a simple average for balance sheet items (i.e., ((beginning + ending)/2)) will control for at least some of this bias and provide a more accurate and meaningful ratio. The limiting assumption is that the change in the balance sheet occurred evenly over the course of the year, which may not always be the case.

The measure of total asset turnover for XYZ is:

$$\text{TAT} = \frac{\text{Sales}}{\text{Average Assets}}$$

$$= \frac{21.240}{\frac{17{,}309 + 22{,}086}{2}}$$

= 1.06

- **Leverage: The Leverage Multiplier**

Leverage ratios measure the extent to which a company relies on debt financing in its capital structure. Debt is both beneficial and costly to a firm. The cost of debt is lower than the cost of equity, an effect which is enhanced by the tax deductibility of interest payments in contrast to taxable dividend payments and stock repurchases. If debt proceeds are invested in projects which return more than the cost of debt, owners keep the residual, and hence, the return on equity is "leveraged up." The debt sword, however, cuts both ways. Adding debt creates a fixed payment required of the firm whether or not it is earning an operating profit, and therefore, payments may cut into the equity base. Further, the risk of the equity position is increased by the presence of debt holders having a superior claim to the assets of the firm. The leverage multiplier employed in the DuPont ratio is directly related to the proportion of

debt in the firm's capital structure. The measure, which divides average assets by average equity, can be restated in two ways, as follows:

$$\frac{\text{Average Assets}}{\text{Average Equity}} = \frac{1}{1 - \left(\frac{\text{Average Debt}}{\text{Average Assets}}\right)}$$

$$\frac{\text{Average Assets}}{\text{Average Equity}} = 1 + \left(\frac{\text{Average Debt}}{\text{Average Assets}}\right)$$

Once again, averages are used to control for potential bias caused by the end-of-year values. The leverage multiplier for XYZ is:

$$\text{Leverage multiplier} = \frac{\text{Average Assets}}{\text{Average Equity}}$$

$$= \frac{19{,}923}{\frac{17{,}209 + 22{,}086}{2}}$$

= 1

- **Combination and Analysis of the Results**

Once the three components have been calculated, they can be combined to form the ROE, as follows:

$$\text{ROE} = \left(\frac{\text{Net Income}}{\text{Sales}}\right) * \left(\frac{\text{Sales}}{\text{Average Assets}}\right) * \left(\frac{\text{Average Assets}}{\text{Avenge Equity}}\right)$$

=22.92 * 1.06 * 1 = 24.3.

While additional measures for prior years would provide the basis for a necessary trend analysis, this result is not meaningful until it is compared to an industry or best practices benchmark. The DuPont ratio/or the Indian IT Industry is:

20*1.01 * 1.1 = 22.2%

As can be seen, strengths in XYZ are immediately evident in the comparison of DuPont values for XYZ and Indian IT Industry. The company appears to be significant in profitability, while total asset turnover seems to be roughly in line with the industry. The overall industry leverage is slightly higher than XYZ'Ss zero debt balance sheet. The analyst can now focus on the company's profitability. A quick analysis of profitability yields the following result:

Sound financial statement analysis is an integral part of the management process for any organization. The DuPont ratio, while not the end in itself, is an excellent way to get a quick snapshot view of the overall performance of a firm in three of the four critical areas of

ratio analysis, profitability, operating efficiency and leverage. By identifying strengths and/or weaknesses in any of the three areas, the DuPont analysis enables the analyst to quickly focus his or her detailed study on a particular spot, making the subsequent inquiry both easier and more meaningful. Some caveats, however, are to be noted.

The DuPont ratio consists of very general measures, drawing from the broadest values on the balance sheets and income statements (e.g., total assets is the most broad of asset measures). A DuPont study is not a replacement for detailed, comprehensive analysis. Further, there may be problems that the DuPont decomposition does not readily identify. For example, an average outcome for net profitability may mask the existence of a low gross margin combined with an abnormally high operating margin. Without looking at the two detailed measures, understanding of the true performance of the firm would be lost.

The DuPont ratio can also be broken into more components called 'The Extended DuPont', depending upon the needs of the analyst In any case, the DuPont can add value, even "on the fly," to understand and solving a broad variety of business problems.

- **Extended DuPont Formula**

$$ROE = \left(\frac{\text{Net Income}}{\text{EBIT}}\right) * \left(\frac{\text{EBIT}}{\text{EBITDA}}\right) * \left(\frac{\text{EBITDA}}{\text{Sales}}\right) * \left(\frac{\text{Sales}}{\text{Average Assets}}\right) * \left(\frac{\text{Average Assets}}{\text{Avenge Equity}}\right)$$

3.7 Cash Conversion Cycle

This liquidity metric expresses the length of time (in days) that a company uses to sell inventory, collect receivables and pay its accounts payable. The cash conversion cycle (CCC) measures the number of days a company's cash is tied up in the production and sales process of its operations and the benefit it gets from payment terms from its creditors. The shorter this cycle, the more liquid the company's working capital position is. The CCC is also known as the "cash" or "operating" cycle.

Cash Conversion Cycle
= Days Inventory Outstanding + Days Sales Outstanding
= Days Payables Outstanding

DIO is computed by

1. Dividing the cost of sales (income statement) by 365 to get a cost of sales per day figure;
2. Calculating the average inventory figure by adding the year's beginning (previous yearend amount) and ending inventory figure (both are in the balance sheet) and dividing by 2 to obtain an average amount of inventory for any given year; and
3. Dividing the average inventory figure by the cost of sales per day figure.

For XYZ FY 2010 (in Rs. crores), its DIO would be computed with these figures:

Cost of Sales per day	= 13771/365=37.73
Average Inventory	= (0+0)/2=0
Days Inventory Outstanding	= 0/37.73=0

DIO gives a measure of the number of days it takes for the company's inventory to turn over, i.e., to be converted to sales, either as cash or accounts receivable. Understandably, being an IT company, DIO for XYZ comes out to be zero.

DSO is computed by

1. Dividing net sales (income statement) by 365 to get a net sales per day figure;
2. Calculating the average accounts receivable figure by adding the year's beginning (previous yearend amount) and ending accounts receivable amount (both figures are in the balance sheet) and dividing by 2 to obtain an average amount of accounts receivable for any given year; and
3. Dividing the average accounts receivable figure by the net sales per day figure.

For XYZ FY 2010 (in Rs. crores), its DSO would be computed with these figures:

Net Sales per day	= 21140/365=57.92
Average Accounts receivables	= (3390+3244)/2=3317
Days Sales Outstanding	= 3317/57.92=57.27

DSO gives a measure of the number of days it takes a company to collect on sales that go into accounts receivables (credit purchases).

DPO is computed by

1. Dividing the cost of sales (income statement) by 365 to get a cost of sales per day figure;
2. Calculating the average accounts payable figure by adding the year's beginning (previous yearend amount) and ending accounts payable amount (both figures are in the balance sheet), and dividing by 2 to get an average accounts payable amount for any given year; and
3. Dividing the average accounts payable figure by the cost of sales per day figure.

For XYZ FY 2010 (in Rs. crores), its DPO would be computed with these figures:

Cost of Sales per day	= 13771/365=37.73
Average Payables	= (1544+1995)/2=1769.5
Days Payable Outstanding	= 1769.5/37.73=46.90

DPO gives a measure of how long it takes the company to pay its obligations to suppliers.

CCC computed:

XYZ'S cash conversion cycle for FY 2005 would be computed with these numbers (rounded):

DIO	0
DSO	57
DPO	47
CCC	10

Often the components of the cash conversion cycle - DIO, DSO and DPO – are expressed in terms of turnover as a times (x) factor. For example, in the case of XYZ, its days debtors outstanding of 57 days would be expressed as turning over 6.4x annually (365 days ÷ 57 days = 6.4 times). However, actually counting days is more literal and easier to understand when considering how fast assets turn into cash.

An often-overlooked metric, the cash conversion cycle is vital for two reasons. First, it's an indicator of the company's efficiency in managing its important working capital assets; second, it provides a clear view of a company's ability to pay off its current liabilities.
It does this by looking at how quickly the company turns its inventory into sales, and its sales into cash, which is then used to pay its suppliers for goods and services. Again, while the quick and current ratios are more often mentioned in financial reporting, investors would be well advised to measure true liquidity by paying attention to a company's cash conversion cycle.

The longer the duration of inventory on hand and of the collection of receivables, coupled with a shorter duration for payments to a company's suppliers, means that cash is being tied up in inventory and receivables and used more quickly in paying off trade payables. If this circumstance becomes a trend, it will reduce, or squeeze, a company's cash availabilities. Conversely, a positive trend in the cash conversion cycle will add to a company's liquidity.

By tracking the individual components of the CCC (as well as the CCC as a whole), an investor is able to discern positive and negative trends in a company's all-important working capital assets and liabilities. For example, an increasing trend in DIO could mean decreasing demand for a company's products. Decreasing DSO could indicate an increasingly competitive product, which allows a company to tighten its buyers' payment terms. As a whole, a shorter CCC means greater liquidity, which translates into less of a need to borrow, more opportunity to realize price discounts with cash purchases for raw materials, and an increased capacity to fund the expansion of the business into new product lines and markets. Conversely, a longer CCC increases a company's cash needs and negates all the positive liquidity qualities just mentioned.

- **Current Ratio Vs. The CCC**

The obvious limitations of the current ratio as an indicator of true liquidity clearly establish a strong case for greater recognition, and use, of the cash conversion cycle in any analysis of a company's working capital position.

Cash Conversion cycle for XYZ over five years :

DIO	**Mar'06**	**Mar '07**	**Mar '08**	**Mar '09**	**Mar '10**
Cost of Sales per day	16.54	24.45	29.27	36.59	37.73
Average Inventory		0.00	0.00	0.00	0.00
Days Inventory Outstanding		**0.00**	**0.00**	**0.00**	**0.00**
DSO					
Net Sales per day	24.73	36.02	42.87	55.52	57.92
Average Accounts receivables		1905.00	2692.50	3241.50	3317.00
Days Sales Outstanding		**52.88**	**62.80**	**58.39**	**57.27**
DPO					
Cost of Sales per day	16.54	24.45	29.27	36.59	37.73
Average Accounts Payable		985.00	1322.50	1513.50	1769.50
Days Payable Outstanding		**40.29**	**45.18**	**41.36**	**46.90**
CCC		**13**	**18**	**17**	**10**

3.8 The Satyam Case and Need for Forensic Accounting

In what became India's biggest corporate scandal till date, Mr. Ramalinga Raju, founder and chairman of Satyam Computers Ltd., one of India's four premier IT companies, admitted of a fraud through a letter addressed to the board of the company in January 2009.

The Fraud

- There was Rs. 5040 crores worth inflated cash and bank balance
- Non-existent accrued interest of Rs. 376 crores
- Understated liability of Rs. 1230 crores
- Overstated debtor position of Rs. 490 crores
- Overstated Revenues & operating profit by Rs. 588 crores

Added together, it was a discrepancy of Rs. 7724 crores in the accounts for a company having annual revenues of Rs. 10,000 odd crores.

Satyam's share price crashed 77% to Rs. 40.25 on the news and the great story for a seemingly successful Indian IT company ended. Fingers were pointed, concerns were raised, complaints were filed and dreams were shattered.

The government was quick to act, appointing a new board for Satyam which helped carry out bidding process for the IT giant and saved the company from extinction.

The Satyam fracas is one more fraud in the long history of misappropriation of resources given in trust to individuals and institutions. What this entire episode brings to the fore, is the following:

- Any control system is only as good as the people administering it
- Audits are not a replacement for responsible management
- Laws and regulations cannot deter persons who wish to defeat them – at least temporarily.

In this context, the relevance of forensic accounting and forensic accounts has grown enormously in recent years. In the interest of organizations and numerous investors who have direct stake in the financial well-being of the organizations, more and more forensic accountants should be involved to ward off financial disasters.

The integration of accounting, auditing and investigative skills yields the speciality known as Forensic Accounting. There is a growing need among analysts, law enforcement professionals, small business owners, and department managers to better understand basic forensic accounting principles, how different types of frauds occur and how to investigate a fraud that is detected in a way that maximizes the chances of successful prosecution of the perpetrator.

Chapter 4 : Valuation Methodologies

One of the approaches on valuation discussed in the previous NCFM module[5] was the so-called *top-down* valuation. In the top-down approach, an analyst investigates both international and domestic economic indicators, such as GDP growth rates, energy prices, inflation, interest rates etc. The search for the best security then trickles down to the analysis of total sales, price levels and foreign competition etc. in a sector in order to identify the best business in the sector.

In the bottom-up approach, the analyst starts the search with specific businesses, irrespective of their industry/region.

4.1 Top-Down Valuation (EIC Analysis)

4.1.1 Economy

The stock market does not operate in a vacuum. It is an integral part of the whole economy of a country. To gain an insight into the complexities of the stock market one needs to develop a sound economic understanding and be able to interpret the impact of important economic indicators, which may be studied to assess the national economy as a whole. The *leading* indicators predict what is likely to happen to an economy. Perfect examples of leading indicators are the unemployment position, rainfall and agricultural production, fixed capital investment, corporate profits, money supply, credit position and the index of equity share prices. An overall growing or a contracting economy affects every industry in the country positively or negatively. One can seldom find flourishing industries in an otherwise stagnant economy. Thus, understanding economy and capital flows, interest rate cycles and currency fluctuations, etc. is very important as it impacts the stock prices.

Economic Indicators

An economic indicator (or business indicator) is a statistic about the economy. Economic indicators allow analysis of economic performance and predictions of future performance. Economic indicators include various indices, earnings reports and economic summaries, such as unemployment, housing starts, consumer price index (a measure for inflation), industrial production, bankruptcies, Gross Domestic Product, broadband internet penetration, retail sales, stock market prices, money supply changes etc. Economic indicators are primarily studied in a branch of macroeconomics called "business cycles". Economic Indicators can have one of three different relationships to the economy:

- **Procyclic:** A procyclic (or procyclical) economic indicator is one that moves in the same direction as the economy. Therefore, if the economy is doing well, this number is usually increasing, whereas if we are in a recession this indicator is decreasing. The Gross Domestic Product (GDP) is an example of a procyclic economic indicator.

[5] Please see NCFM's Investment Analysis and Portfolio Management module for more details.

- **Counter cyclic:** A counter-cyclic (or countercyclical) economic indicator is one that moves in the opposite direction as the economy. The unemployment rate gets larger as the economy gets worse so it is a counter-cyclic economic indicator.
- **Acyclic:** An acyclic economic indicator is one that is not related to the health of the economy and is generally of little use. They have little or no correlation to the business cycle: they may rise or fall when the general economy is doing well, and may rise or fall when it is not doing well.

Economic indicators fall into three categories: leading, lagging and coincident.

Leading economic indicators are indicators which change before the economy changes. Stock market returns are a leading indicator, as the stock market usually begins to decline before the economy declines and they improve before the economy begins to pull out of a recession. Baltic Dry Index, an index that tracks bulk dry freight rates across the world is another leading indicator and indicates a slowdown in the bookings for bulk dry carriers with its fall and thus indicating a subsequent slowdown in the international trade. Leading economic indicators are the most important type for investors as they help predict what the economy will be like in the future.

A lagging economic indicator is one that does not change direction until a few quarters after the economy does. The unemployment rate is a lagged economic indicator as unemployment tends to increase for 2 or 3 quarters after the economy starts to improve.

Coincident indicators are those which change at approximately the same time and in the same direction as the whole economy, thereby providing information about the current state of the economy. Personal income, GDP, industrial production and retail sales are coincident indicators. A coincident index may be used to identify, after the fact, the dates of peaks and troughs in the business cycle.

Many different groups collect and publish economic indicators in different countries. In the U.S. the collection of economic indicators is published by the United States Congress. Their Economic Indicators are published monthly and are available for download in PDF and text formats. The indicators fall into seven broad categories. Each of the statistics in these categories helps create a picture of the performance of the economy and how the economy is likely to do in the future.

- **Total Output, Income, and Spending**

  These tend to be the broadest measures of economic performance and include such statistics as the Gross Domestic Product which is used to measure economic activity and thus is both procyclical and a coincident economic indicator. The Implicit Price Deflator is a measure of inflation. Inflation is procyclical as it tends to rise during booms and falls during periods of economic weakness. Measures of inflation are also coincident indicators. Consumption and consumer spending are also procyclical and coincident.

- **Employment, Unemployment, and Wages**

  The unemployment rate is a lagged, countercyclical statistic. The level of civilian employment measures how many people are working so it is procyclic. Unlike the unemployment rate it is a coincident economic indicator.

- **Production and Business Activity**

  These statistics cover how much businesses are producing and the level of new construction in the economy. Changes in business inventories is an important leading economic indicator as they indicate changes in consumer demand. New construction including new home construction is another procyclical leading indicator which is watched closely by investors. A slowdown in the housing market during a boom often indicates that a recession is coming, whereas a rise in the new housing market during a recession usually means that there are better times ahead.

- **Prices**

This category includes both the prices consumers pay as well as the prices businesses pay for raw materials and include:

- Producer Prices [monthly]
- Consumer Prices [monthly]
- Prices Received And Paid By Farmers [monthly]

These measures are all measures of changes in the price level and thus measure inflation.

- **Money, Credit, and Security Markets**

These statistics measure the amount of money in the economy as well as interest rates and include:

- Money stock (M1, M2, and M3) [monthly]
- Bank Credit at all commercial banks [monthly]
- Consumer credit [monthly]
- Interest rates and bond yields [weekly and monthly]
- Stock prices and yields [weekly and monthly]

Nominal interest rates are influenced by inflation, so like inflation they tend to be procyclical and a coincident economic indicator. Stock market returns are also procyclical but they are a leading indicator of economic performance.

- **Government Finance**

These are measures of government spending and government deficits and debts:

- Budget Receipts (Revenue)[yearly]
- Budget Outlays (Expenses) [yearly]
- Union Government Debt [yearly]

Governments generally try to stimulate the economy during recessions and to do so they increase spending without raising taxes. This causes both government spending and government debt to rise during a recession, so they are countercyclical economic indicators. They tend to be coincident to the business cycle.

- **International Trade**

These are measure of how much the country is exporting and how much they are importing:

- Industrial Production and Consumer Prices of Major Industrial Countries
- International Trade In Goods and Services
- International Transactions

When times are good people tend to spend more money on both domestic and imported goods. The level of exports tends not to change much during the business cycle. So the balance of trade (or net exports) is countercyclical as imports outweigh exports during boom periods. Measures of international trade tend to be coincident economic indicators.

While we cannot predict the future perfectly, economic indicators help us understand where we are and where we are going which is of great help when assessing the overall health of the economy.

4.1.2 Industry

Fundamental analysis consists of a detailed analysis of a specific industry; its characteristics, past record, present state and future prospects. The purpose of industry analysis is to identify those industries with a potential for future growth and to invest in equity shares of companies selected from such industries. We look at the product lifecycle phase and competitive outlook in a particular industry to gauge the overall growth and competitive rivalry amongst the players in the industry.

4.1.3 Company

At the final stage of fundamental analysis, the investor analyses the company. This analysis has two thrusts:

1. How has the company performed vis-à-vis other similar companies? and
2. How has the company performed in comparison to earlier years

It is imperative that one completes the economic analysis and the industry analysis before a company is analysed because the company's performance at a period of time is to an extent a reflection of the economy, the political situation and the industry.
What does one look at when analysing a company? There is no point or issue too small to be ignored. Everything matters.

The different issues regarding a company that should be examined are:

1. The Management
2. The Company
3. The Annual Report
4. Cash flow
5. Ratios

The Management

The single most important factor one should consider when investing in a company and one often overlooked, is its management. It is upon the quality, competence and vision of the management that the future of company rests. A good, competent management can make a company grow while a weak, inefficient management can destroy a thriving company. Indian corporate history has many examples where an able and visionary management has worked wonders for companies and their stock prices. Sunil Mittal of Bharti Airtel, Azim Premji of Wipro, Narayan Murthy of XYZ, Deepak Parekh of HDFC, are few such examples where the management of the companies headed by strong leadership have helped companies create significant wealth for their investors.

In India, management can be broadly divided in two types:

1. Family Management
2. Professional Management

Family management

Family managed companies are those that have at the helm a member of the owner or controlling family. The Chairman or the Chief Executive Officer is usually a member of the controlling family and the Board of Directors are peopled either by members of the family or their friends and associates. All policy is determined by the controlling family and while some policies may be good, some of the policies may not necessarily be in the shareholders' best interest. The advantage of such companies is the loyalty family members would have to the company which they consider their own. Earlier, family managed companies were often orthodox, autocratic, rigid and averse to change. This is no longer true. There have been some changes in the way family controlled businesses are managed. In many family managed companies, although the man at the helm is a scion of the family, the management is run by professional managers. Many such businesses are very successful.

Professional Management

Professionally managed companies are those that are managed by professionals who are employees of the company. In such companies, the chief executive officer often does not even have a financial stake in the company (or a minority stake). He is at the helm of affairs because of his ability and experience. The professional manager is a career employee

and he remains at the seat of power so long as he meets the company's business targets. Consequently, he is always result-oriented and his aim is often meeting the annual budget and business targets. He may not necessarily be tied to the company by loyalty but is focussed on performance on a consistent basis which improves shareholder value. As a professional he is usually aware of the latest trends in management philosophy and tries to introduce these to maximise employee performance. He tries to run his company as a lean, effective machine striving for increased efficiency and productivity. As a consequence professionally managed companies are usually well-organized, growth-oriented and good performers. Companies that come readily to mind are ITC, HDFC, Hindustan Lever, L&T to name a few. One disadvantage of professionally managed companies is that the professional managers may leave the company for better pay and perquisites offered by another company. This is a loss for the company especially if the person is a high performer. Many companies therefore promote or create long term commitment and loyalty by offering employees stock options (i.e. giving them shares of the company). The employee thus becomes a part owner and becomes interested in the sustainability and profitability of the enterprise. It is a win-win situation for both. The company gets the services of a loyal competent employee. The employee builds his wealth.
It is a fact that in many professionally managed companies there is corporate politics. This is because managers are constantly trying to climb up the corporate ladder. The end is often what matters, not the means. Often too, as a consequence, the best person does not get the top job; rather losing out in the political environment. This does not always happen in family managed companies as one is aware that the mantle of leadership will always be worn by the son or daughter of the owner.

What to look for

It would be unfair to state that one should invest only in professionally managed companies and overlook family managed companies. There are well managed, profitable companies in both categories. There are also badly managed companies in both categories. What then are the factors one should look for?

- **Integrity of Management**

The most important aspect is management integrity. This must be beyond question. It is often stated that a determined employee can perpetrate a fraud, despite good systems and controls. Similarly, if it so desires, the management can juggle figures and cause great harm and financial loss to a company (for their own personal gain). Tracking integrity may not be easy but over time managements distinguish themselves from others on issues of honesty and integrity.

- **Past record of management**

Another point to consider is proven competence, i.e. the past record of the management. How has the management managed the affairs of the company during the last few years? Has

the company grown? Has it become more profitable? Has it grown more impressively than others in the same industry? It is always wise to be a little wary of new management and new companies. Wait until the company shows signs of success and the management proves its competence.

- **How highly is the management rated by its peers in the same industry?**

This is a very telling factor. Competitors are aware of nearly all the strengths and weaknesses of management of their rivals and if they hold the management in high esteem it is truly worthy of respect. It should be remembered that the regard the industry has of the management of a company is usually impartial, fair and correct.

- **How the management fares in adversity?**

In good times everyone does well. The inherent strength of a management is tested at times of adversity. During a time of recession or depression, it is important to consider how well the management did: Did it streamline its operations? Did it close down its factories? Did it (if it could) get rid of employees? Was it able to sell its products? Did the company perform better than its competitors? How did sales fare? A management that can steer its company in difficult days will normally always do well.

- **The depth of knowledge of the management**

Its knowledge of its products, its markets and the industry is of paramount importance because upon this can depend the success of a company. Often the management of a company that has enjoyed a preeminent position sits back thinking that it will always be the dominant company. In doing so, it loses its touch with its customers, its markets and its competitors. The reality sinks in only when it is too late. The management must be in touch with the industry and customers at all times and be aware of the latest techniques and innovations. Only then can it progress and keep ahead. A quick way of checking this is to determine what the market share of the company's products is and whether the share is growing or at least being maintained.

- **The management must be open, innovative and must also have a strategy**

It must be prepared to change when required. It must essentially know where it is going and have a plan of how to get there. It must be receptive to ideas and be dynamic. A company that has many layers of management and is top heavy tends to be very bureaucratic and ponderous. There are "many chiefs and few braves". They do not want change and often stand in the way of change. Their strategy is usually a personal one, on how to hold onto their jobs.

- **Non-professionalised Management**

It is not recommended investing in a company that is yet to professionalize because in such companies decisions are made on the whims of the chief executive and not with the good of

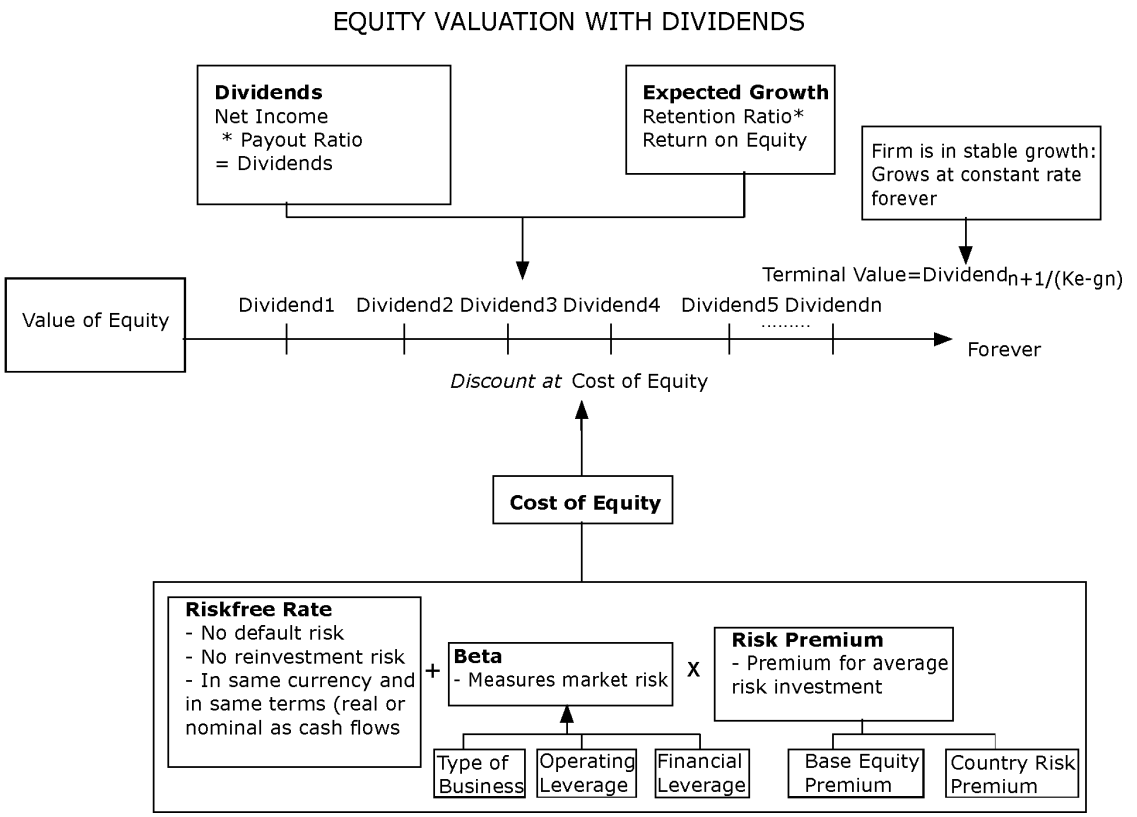
the company in mind. In such companies the most competent are not given the positions of power. There may be nepotism with the nephews, nieces, cousins and relatives of the chief executive holding positions not due to proven competence but because of blood ties.

4.2 Discounted Cash Flow (DCF) Models

In discounted cash flow valuation, the value of an asset is the present value of the expected cash flows on the asset. The cash flow could be either the dividend which is actually paid out to shareholders or free cash flow which is accrued to the firm or to the shareholders. The basic principle behind the DCF models is that every asset has an intrinsic value that can be estimated, based upon its characteristics in terms of cash flows, growth and risk. The information required in order to find out the intrinsic value of any asset using DCF is :

- to estimate the life of the asset
- to estimate the cash flows during the life of the asset
- to estimate the discount rate to apply to these cash flows to get present value

In case of a stock, the assumption of going concern entails that we use perpetuity as our estimated life of a company (and hence stock) unless conditions require assumptions otherwise. The estimate of cash flow could be divided as, Free Cash Flow to Firm (FCFF) or Free Cash Flow to Equity (FCFE) depending upon the exact method of DCF valuation we choose. The discount rate used to deduce the present value should reflect the uncertainty (risk) of the cash flows and opportunity cost of capital. (Please refer to earlier section on Opportunity cost)



4.3 Dividend Discount Model (DDM)

In the strictest sense, the only cash flow you receive from a firm when you buy publicly traded stock is the dividend. The simplest model for valuing equity is the dividend discount model -- the value of a stock is the present value of expected dividends on it. While many analysts have turned away from the dividend discount model and viewed it as outmoded, much of the intuition that drives discounted cash flow valuation is embedded in the model. In fact, there are specific companies where the dividend discount model remains a useful tool for estimating value.

The General Model

When an investor buys stock, she generally expects to get two types of cash-flows - dividends during the period she holds the stock and an expected price at the end of the holding period. Since this expected price is itself determined by future dividends, the value of a stock is the present value of dividends through infinity.

$$\text{Value per share of stock} = \sum E\left(\frac{E(DPSt)}{(1+Ke)^t}\right)$$

Where

DPS_t = Expected dividends per share

K_e = Cost of equity

The rationale for the model lies in the present value rule - the value of any asset is the present value of expected future cash flows discounted at a rate appropriate to the riskiness of the cash flows. There are two basic inputs to the model - expected dividends and the cost on equity. To obtain the expected dividends, we make assumptions about expected future growth rates in earnings and pay-out ratios. The required rate of return on a stock is determined by its riskiness, measured differently in different models - the market beta in the CAPM and the factor betas in the arbitrage and multi-factor models. The model is flexible enough to allow for time-varying discount rates, where the time variation is caused by expected changes in interest rates or risk across time.

Gordon Growth Model

The Gordon growth model can be used to value a firm that is in 'steady state' with dividends growing at a rate that can be sustained forever. The Gordon growth model relates the value of a stock to its expected dividends in the next time period, the cost of equity and the expected growth rate in dividends.

$$\text{Value per share of stock} = \sum\left(\frac{DPS_1}{Ke - g}\right)$$

Where,

DPS_1 = Expected Dividends one year from now (next period)

K_e= Required rate of return for equity investors

g = Growth rate in dividends forever

What is a stable growth rate?

While the Gordon growth model is a simple and powerful approach to valuing equity, its use is limited to firms that are growing at a stable rate. There are two insights worth keeping in mind when estimating a 'stable' growth rate. First, since the growth rate in the firm's dividends is expected to last forever, the firm's other measures of performance (including earnings) can also be expected to grow at the same rate. To see why, consider the consequences in the long term of a firm whose earnings grow 6% a year forever, while its dividends grow at 8%. Over time, the dividends will exceed earnings. On the other hand, if a firm's earnings grow at a faster rate than dividends in the long term, the pay-out ratio, in the long term, will converge towards zero, which is also not a steady state. Thus, though the model's requirement is for the expected growth rate in dividends, analysts should be able to substitute in the expected growth rate in earnings and get precisely the same result, if the firm is truly in steady state

The second issue relates to what growth rate is reasonable as a 'stable' growth rate. This growth rate has to be less than or equal to the growth rate of the economy in which the firm operates. This does not, however, imply that analysts will always agree about what this rate should be even if they agree that a firm is a stable growth firm for three reasons.

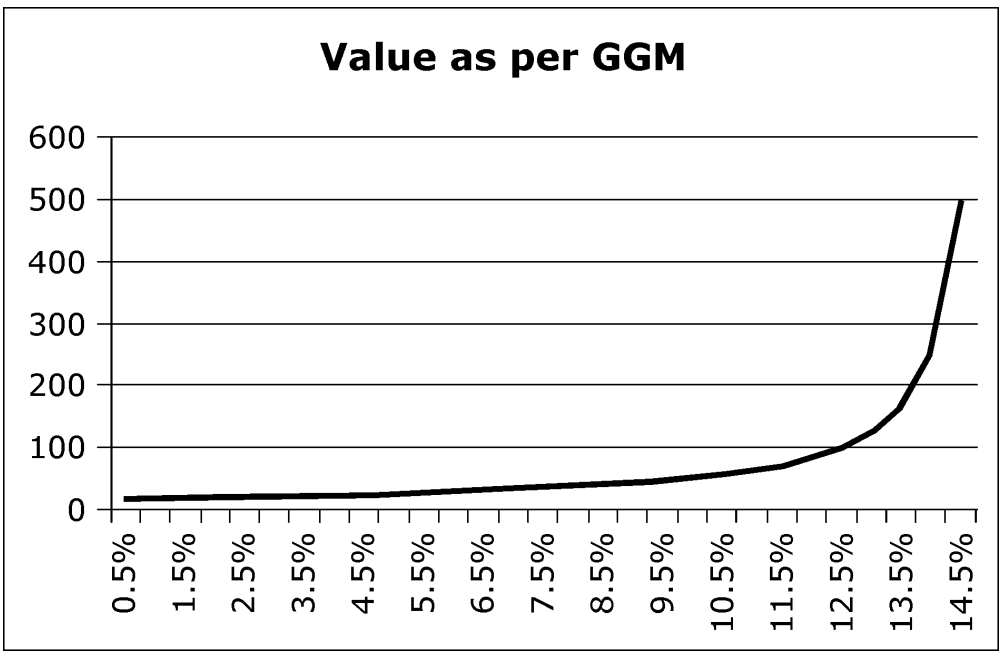
1. Given the uncertainty associated with estimates of expected inflation and real growth in the economy, there can be differences in the benchmark growth rate used by different analysts, i.e., analysts with higher expectations of inflation in the long term may project a nominal growth rate in the economy that is higher.
2. The growth rate of a company may not be greater than that of the economy but it can be less. Firms can becomes smaller over time relative to the economy.
3. There is another instance in which an analyst may stray from a strict limit imposed on the 'stable growth rate'. If a firm is likely to maintain a few years of 'above-stable' growth rates, an approximate value for the firm can be obtained by adding a premium to the stable growth rate, to reflect the above-average growth in the initial years. Even in this case, the flexibility that the analyst has is limited. The sensitivity of the model to growth implies that the stable growth rate cannot be more than 1% or 2% above the growth rate in the economy. If the deviation becomes larger, the analyst will be better served using a two-stage or a three-stage model to capture the 'super-normal' or 'above-average' growth and restricting the Gordon growth model to when the firm becomes truly stable.

Limitations of the model

The Gordon growth model is a simple and convenient way of valuing stocks but it is extremely sensitive to the inputs for the growth rate. Used incorrectly, it can yield misleading or even absurd results, since, as the growth rate converges on the discount rate, the value goes to infinity. Consider a stock, with an expected dividend per share next period of Rs. 2.50, a cost of equity of 15%, and an expected growth rate of 5% forever. The value of this stock should be :

$$\text{Value} = \frac{2.5}{0.15 - 0.05} = \text{Rs. } 25$$

Note, however, the sensitivity of this value to estimates of the growth rate in the Figure :



As the growth rate approaches the cost of equity, the value per share approaches infinity. If the growth rate exceeds the cost of equity, the value per share becomes negative.

This issue is tied to the question of what comprises a stable growth rate. For instance, an analyst who uses a 14% growth rate and obtains a Rs. 250 value would have been violating a basic rule on what comprises stable growth.

In summary, the Gordon growth model is best suited for firms growing at a rate comparable to or lower than the nominal growth in the economy and which have well established dividend pay-out policies that they intend to continue into the future. The dividend pay-out of the firm has to be consistent with the assumption of stability, since stable firms generally pay substantial dividends. In particular, this model will under estimate the value of the stock in firms that consistently pay out less than they can afford and accumulate cash in the process.

Two-stage Dividend Discount Model

The two-stage growth model allows for two stages of growth - an initial phase where the growth rate is not a stable growth rate and a subsequent steady state where the growth rate is stable and is expected to remain so for the long term. While, in most cases, the growth rate during the initial phase is higher than the stable growth rate, the model can be adapted to value companies that are expected to post low or even negative growth rates for a few years and then revert back to stable growth. The model is based upon two stages of growth, an extraordinary growth phase that lasts n years and a stable growth phase that lasts forever afterwards.

Extraordinary growth rate: g% each year for n years

Stable growth rate: gn forever

$$\text{Value of the Stock} = \text{PV(Dividends during extraordinary phase)} + \text{PV(terminal price)}$$

$$P_0 = \sum \left(\frac{(DPS_t)}{(1 + K_{ehg})^t} \right) + \frac{P_2}{(1 + K_{ehg})^n}$$

Where

$$P_n = \sum \left(\frac{DPS_{n+1}}{K_{est} - gn} \right)$$

Where

DPS_t = Expected dividends per share in year t

K_e = Cost of Equity (hg: High Growth period; st: Stable growth period)

P_n = Price (terminal value) at the end of year n

g = Extraordinary growth rate for the first n years

g_n = Steady state growth rate forever after year n

The same constraint that applies to the growth rate for the Gordon Growth Rate model, i.e., that the growth rate in the firm is comparable to the nominal growth rate in the economy, applies for the terminal growth rate (gn) in this model as well. In addition, the pay-out ratio has to be consistent with the estimated growth rate. If the growth rate is expected to drop significantly after the initial growth phase, the pay-out ratio should be higher in the stable phase than in the growth phase. A stable firm can pay out more of its earnings in dividends than a growing firm.

$$\text{Expected Growth} = \text{Retention ratio} * \text{Return on equity}$$

$$\text{Stable Payout Ratio} = \frac{\text{Stable Growth Rate}}{\text{Stable Period ROE}}$$

Thus, a firm with a 5% growth rate and a return on equity of 15% will have a stable period pay-out ratio of 33.33%.

Limitations of the model

There are three problems with the two-stage dividend discount model – the first two would apply to any two-stage model and the third is specific to the dividend discount model.

1. The first practical problem is in defining the length of the extraordinary growth period. Since the growth rate is expected to decline to a stable level after this period, the value of an investment will increase as this period is made longer. It is difficult in practice to convert these qualitative considerations into a specific time period.
2. The second problem with this model lies in the assumption that the growth rate is high during the initial period and is transformed overnight to a lower stable rate at the end of the period. While these sudden transformations in growth can happen, it is much more realistic to assume that the shift from high growth to stable growth happens gradually over time.
3. The focus on dividends in this model can lead to skewed estimates of value for firms that are not paying out what they can afford in dividends. In particular, we will under estimate the value of firms that accumulate cash and pay out too little in dividends.

Since the two-stage dividend discount model is based upon two clearly delineated growth stages, high growth and stable growth, it is best suited for firms which are in high growth and expect to maintain that growth rate for a specific time period, after which the sources of the high growth are expected to disappear. One scenario, for instance, where this may apply is when a company has patent rights to a very profitable product for the next few years and is expected to enjoy super-normal growth during this period. Once the patent expires, it is expected to settle back into stable growth. Another scenario where it may be reasonable to make this assumption about growth is when a firm is in an industry which is enjoying super-normal growth because there are significant barriers to entry (either legal or as a consequence of infra-structure requirements), which can be expected to keep new entrants out for several years. The assumption that the growth rate drops precipitously from its level in the initial phase to a stable rate also implies that this model is more appropriate for firms with modest growth rates in the initial phase. For instance, it is more reasonable to assume that a firm growing at 12% in the high growth period will see its growth rate drops to 6% afterwards than it is for a firm growing at 40% in the high growth period.

Finally, the model works best for firms that maintain a policy of paying out most of residual cash flows – i.e, cash flows left over after debt payments and reinvestment needs have been met – as dividends.

The two-stage model can also be extended to a multi-stage model that takes into consideration the gradual transition in the growth rates, etc. However, in reality, forecasting the growth rates in distant future is a task involving so many uncertainties that it’s not worthwhile doing so in realistic valuation exercise.

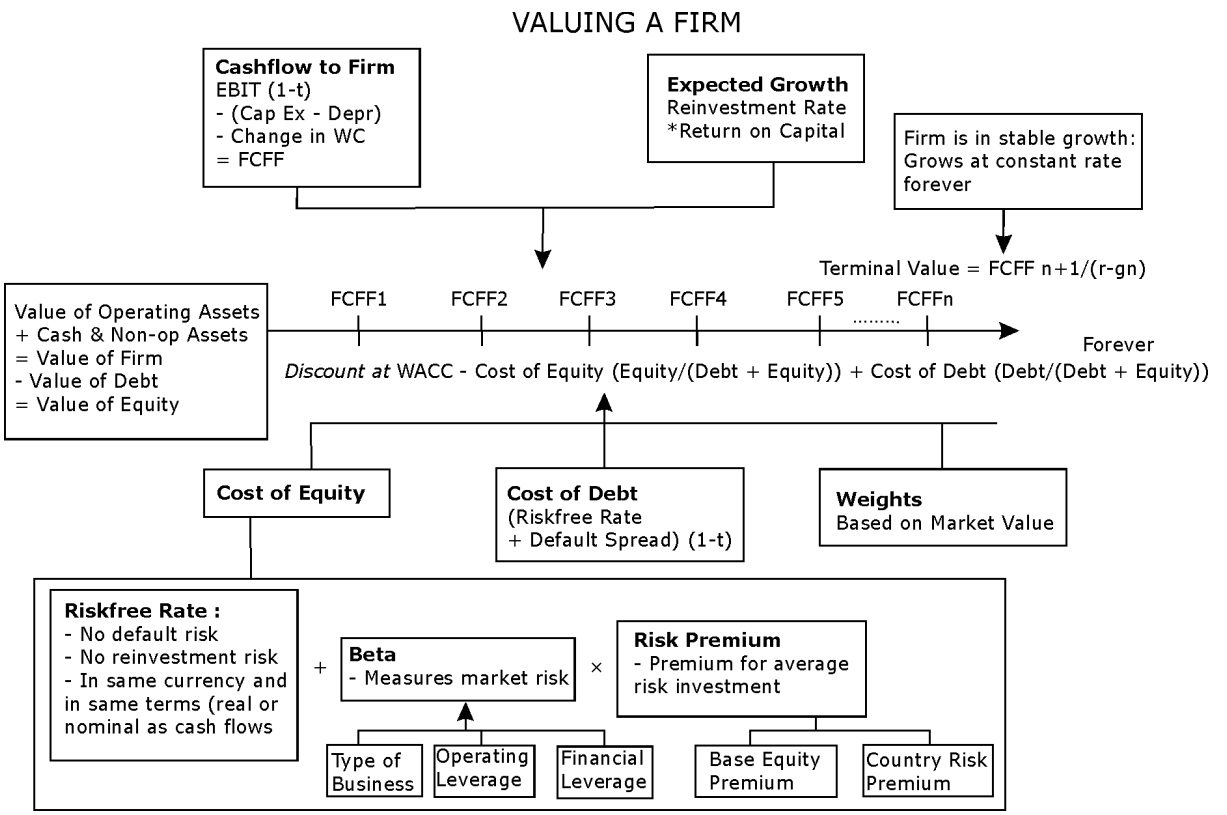
4.4 FCFF and FCFE based DCF

Analysts like to use free cash flow valuation models (FCFF or FCFE) whenever one or more of the following conditions are present:

- The firm is not dividend paying
- The firm is dividend paying but dividends differ significantly from the firm's capacity to pay dividends
- Free cash flows align with profitability within a reasonable forecast period with which the analyst is comfortable
- The investor takes a control perspective

The FCFF approach computes the value of the firm by discounting the free cash flow to the firm at the Weighted Average Cost of Capital (WACC) of the firm and then deducting the value of non-common stock capital (usually debt and preferred stock) to arrive at the value of equity.

The FCFE approach on the other hand can be used to directly find out the fair value of the equity of the firm by valuing free cash flows available to equity shareholders discounted at cost of capital.



Free cash flow to firm is the cash available to bond holders and stock holders after all expenses and investments have taken place. It's one of the many benchmarks used to compare and

analyse financial health and in the valuation exercise. A positive value would indicate that the firm has cash left after expenses. A negative value, on the other hand, would indicate that the firm has not generated enough revenue to cover its costs and investment activities. In that instance, an investor should dig deeper to assess why this is happening - it could be a sign that the company may have some deeper problems.

FCFE is the cash available to stock holders after all expense, investments and interest payments to debt-holders on an after tax basis.

$$FCFF = NI + NCC + 1(1 - T) - FC - WC$$

NCC= non-cash charges such as depreciation and amortization

NI = Net income.

I (1-t) = After-tax interest expense.

FC = Change in fixed capital investments.

WC = Change in working capital investments.

CFO = cash flow from operations

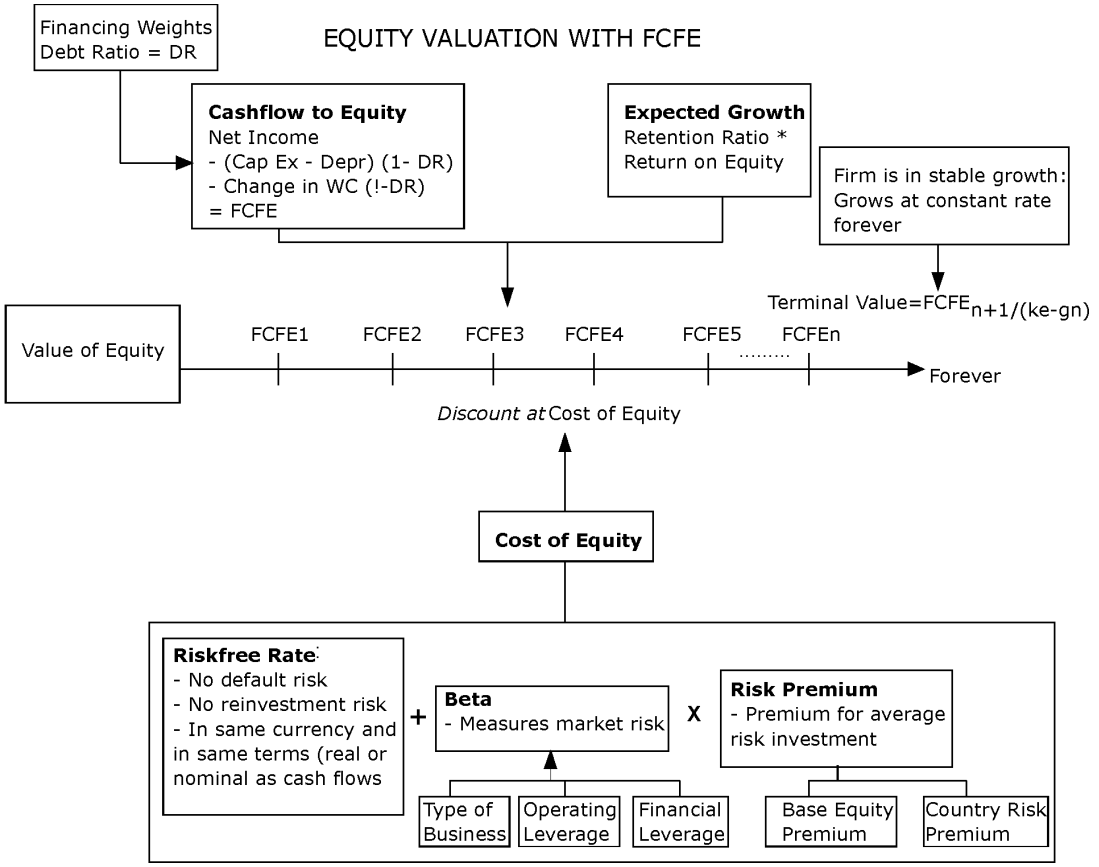
Net income is post the interest paid to the company's bondholders, but the definition of FCFF is the cash available to the firm's bondholders and equity holders. So it is the money before paying the interest, thus, we need to add back the after tax expense of interest.

$$FCFF = EBIT(1 - T) + NCC - FC - WC$$

FCFF is on an after tax basis and EBIT is before taxes, so we need to multiply by the firm's after tax rate which is (1-T). EBIT is pre interest charges, so we do not need to add back I (1-T).

$$FCFF = CFO - FC + 1(1 - t)$$

CFO adds back depreciation and takes account of change in WC, so the only thing left that is not accounted for is the interest expense and change in Fixed Capital Investments.



Free cash flow to equity (FCFE) is the cash flow available to the firm's common equity holders after all operating expenses, interest and principal payments have been paid, and necessary investments in working and fixed capital have been made.

FCFE is the cash flow from operations minus capital expenditures minus payments to (and plus receipts from) debt holders.

$$\text{FCFE} = \text{FCFF} + \text{Net Borrowing} - 1(1 - \text{T})$$

We need to subtract the interest expense now because FCFE is all the cash available to stock holders.

$$\text{FCFE} = \text{NI} + \text{NCC} - \text{FC} - \text{WC} + \text{Net Borrowing}$$

This formula again doesn't include the addition of I (1-T) back because NI already deducted it out.

$$\text{FCFE} = \text{CFO} + \text{Net Borrowing} - \text{FC}$$

Notice FCFF adds back I (1-T) but FCFE doesn't.

The value of equity can be found by discounting FCFE at the required rate of return on equity r:

Since FCFE is the cash flow remaining for equity holders after all other claims have been satisfied, discounting FCFE by r (the required rate of return on equity) gives the value of the firm's equity.

Dividing the total value of equity by the number of outstanding shares gives the value per share.

Computing FCFF and FCFE based upon historical accounting data is straightforward. Often times, this data is then used directly in a single-stage DCF valuation model.

FCFE in any period will be equal to FCFE in the preceding period times (1 + g):

$$\text{FCFEt} = \text{FCFEt} - 1 * (1 + g)$$

If we assume that at some time in the future the company will grow at a constant growth rate g forever, then using Gordon Growth Model, we get the terminal value as

The value of equity if FCFE is growing at a constant rate g is

$$\text{TV} = \frac{\text{FCFEt}}{\text{Ke} - g}$$

The discount rate is K_e, the required return on equity. The growth rate of FCFF and the growth rate of FCFE are frequently not equivalent.

On other occasions, the analyst desires to forecast future FCFF or FCFE directly. In this case, the analyst must forecast the individual components of free cash flow. Given that we have a variety of ways in which to derive free cash flow on a historical basis, it should come as no surprise that there are several methods of forecasting free cash flow.

One approach is to compute historical free cash flow and apply some constant growth rate. This approach would be appropriate if free cash flow for the firm tended to grow at a constant rate and if historical relationships between free cash flow and fundamental factors were expected to be maintained.

If the firm finances a fixed percentage of its capital spending and investments in working capital with debt, the calculation of FCFE is simplified. Let DR be the debt ratio, debt as percentage of assets. In this case, FCFE can be written as

$$\text{FCFE} = \text{NI} - (1 - \text{DR}) * (\text{Capital Spending} - \text{Depreciation})$$

When building FCFE valuation models, the logic, that debt financing is used to finance a constant fraction of investments, is very useful. This equation is pretty common.

When we are calculating FCFE starting with Net income available to common shareholders, if preferred dividends were already subtracted when arriving at Net income available to common, no further adjustment for Preferred dividends is required. However, issuing (redeeming)

preferred stock increases (decreases) the cash flow available to common stockholders, so this term would be added in.

In many respects, the existence of preferred stock in the capital structure has many of the same effects as the existence of debt, except that preferred stock dividends paid are not tax deductible, unlike interest payments on debt.

When calculating FCFF or FCFE, investments in working capital do not include any investments in cash and marketable securities. The value of cash and marketable securities should be added to the value of the firm's operating assets to find the total firm value.

Some companies have substantial non-current investments in stocks and bonds that are not operating subsidiaries but financial investments. These should be reflected at their current market value. Based on accounting conventions, those securities reported at book values should be revalued to market values.

Finally, many corporations have overfunded or underfunded pension plans. The excess pension fund assets should be added to the value of the firm's operating assets. Likewise, an underfunded pension plan should result in an appropriate subtraction from the value of operating assets.

Finally, we value XYZ using the FCFE method of valuation. Please note that FCFF and FCFE both will yield the same intrinsic value of XYZ equity as the company does not have any debt on its balance sheet.

Step 1—Forecast Expected Cash Flow: the first order of business is to forecast the expected cash flow for the company based on assumptions regarding the company's revenue growth rate, net operating profit margin, income tax rate, fixed investment requirement, and incremental working capital requirement. We describe these variables and how to estimate them in other screens.

Step 2—Estimate the Discount Rate: the next order of business is to estimate the company's weighted average cost of capital (WACC), which is the discount rate that's used in the valuation process. We describe how to do this using easily observable inputs in other screens.

Step 3—Calculate the Value of the Corporation: the company's WACC is then used to discount the expected cash flows during the Excess Return Period to get the corporation's Cash Flow from Operations. We also use the WACC to calculate the company's Residual Value. To that we add the value of Short-Term Assets on hand to get the Corporate Value.

Step 4—Calculate Intrinsic Stock Value: we then subtract the values of the company's liabilities—debt, preferred stock, and other short-term liabilities to get Value to Common Equity, divide that amount by the amount of stock outstanding to get the per share intrinsic stock value.

Assumptions

Risk-free Rate	7.8%
Beta (XYZ)	0.8
Market Required Rate of Return	14%
XYZ'S cost of Equity	12.8%

High-Growth Phase

Return on Equity	**27%**
Pay-out Ratio	25%
Growth Rate	=27%*(1-25%)=20%
High Growth Period	7 Years

Constant Growth Phase

Return on Equity	20%
Payout Ratio	80%
Growth Rate	=20%*(1-80%)=4%

$$FCFE = NI + NCC - FC - WC + \text{Net Borrowing}$$

= (5,803 – 958) + 0 - (3244-3390+1995-1544) + 0

= 4,845-305

= 4540

	FCFE	**Growth Rate**	**Present Value**
	$FCFE_t=FCFE_{t-1}*(1+g)$	=RoE*(1-b)	$=FCFE_t/(1+K_e)^t$
FCFE0	4540	20%	
FCFE1	5459	20%	4842
FCFE2	6565	20%	5163
FCFE3	7894	20%	5506
FCFE4	9493	20%	5872
FCFE5	11415	20%	6262
FCFE6	13727	20%	6678
FCFE7	16506	20%	7121
Constant FCFE	17167	4%	84546
Total PV			125990
Shares Outstanding (Crores)			57
Value per Share			2195

4.5 Sum Of The parts (SOTP)

An approach to valuing a company in which each business unit / operation is valued based on either discounted free cash flows (DCF) or peer multiples. The sum of these parts makes up the total enterprise value (EV) of the company (value of operations).

SOTP is regarded as the best tool to value companies with diversified business interests. It evaluates each business or division of the company separately and assigns a value to its

contribution. This valuation also captures future potential of the new ventures which are not generating revenues right now. At the end, the values of all the parts (including core business) are added up to arrive at an approximate value of the company as a whole. SOTP valuation indicates if the company's value would be increased if it was split into separate business units.

Consider a company that has three business divisions – a power generation plant, a sugar manufacturing business and a confectionery business. The approach that we take here is that we treat each of these businesses as a different strategic business unit (SBU) having its own Balance Sheet and P&L. In turn we assume that each of these businesses has a different risk, sources and uses of funds, different RoEs and different growth rates which is a fairly logical thing to do considering the nature of three businesses. We then use either DCF or price multiples to come up with value of each business and thus come up with the EV and subsequently value of equity of the firm.

Relative Valuation

In relative valuation, the value of an asset is compared to the values assessed by the market for similar or comparable assets**.** To do relative valuation then

- we need to identify comparable assets and obtain market values for these assets.
- convert these market values into standardized values, since the absolute prices cannot be compared This process of standardizing creates price multiples.
- compare the standardized value or multiple for the asset being analyzed to the standardized values for comparable asset, controlling for any differences between the firms that might affect the multiple, to judge whether the asset is under or overvalued.

Most valuations in the markets are relative valuations

- Almost 85% of equity research reports are based upon a multiple and comparables.
- More than 50% of all acquisition valuations are based upon multiples
- Rules of thumb based on multiples are not only common but are often the basis for final valuation judgments.

While there are more discounted cashflow valuations in consulting and corporate finance, they are often relative valuations masquerading as discounted cash flow valuations.

- The objective in many discounted cashflow valuations is to back into a number that has been obtained by using a multiple.
- The terminal value in a significant number of discounted cashflow valuations is estimated using a multiple.

Relative valuation is much more likely to reflect market perceptions and moods than discounted cash flow valuation. This can be an advantage when it is important that the price reflect these perceptions as is the case when,

- the objective is to sell a security at that price today (as in the case of an IPO)
- investing on "momentum" based strategies

With relative valuation, there will always be a significant proportion of securities that are undervalued and overvalued. Since portfolio managers are judged based upon how they perform on a relative basis (to the market and other money managers), relative valuation is more tailored to their needs. Relative valuation generally requires less information than discounted cash flow valuation (especially when multiples are used as screens).

Even if you are a true believer in discounted cashflow valuation, presenting your findings on a relative valuation basis will make it more likely that your findings/recommendations will reach a receptive audience. In some cases, relative valuation can help find weak spots in discounted cash flow valuations and fix them. The problem with multiples is not in their use but in their abuse. If we can find ways to frame multiples right, we should be able to use them better.

4.6 Price / Earnings Ratio

The P/E ratio (price-to-earnings ratio) of a stock (also called its "P/E", or simply "multiple") is a measure of the price paid for a share relative to the annual net income or profit earned by the firm per share. It is a financial ratio used for valuation: a higher P/E ratio means that investors are paying more for each unit of net income, so the stock is *more* expensive compared to one with lower P/E ratio. The P/E ratio has units of *years,* which can be interpreted as "number of years of earnings to pay back purchase price", ignoring the time value of money. In other words, P/E ratio shows current investor demand for a company share. The reciprocal of the PE ratio is known as the earnings yield. The earnings yield is an estimate of expected return to be earned from holding the stock.

Price-to-earnings ratio is popular in the investment community. Earnings power is the primary determinant of investment value.

PE = Market Price per Share / Earnings Per Share

There are a number of variants on the basic PE ratio in use. They are based upon how the price and the earnings are defined.

Price: is usually the current price is sometimes the average price for the year
Earnings Per Share (EPS):

- earnings per share in most recent financial year
- earnings per share in trailing 12 months (Trailing PE)
- forecasted earnings per share next year (Forward PE)
- forecasted earnings per share in future year

Trailing P/E or P/E TTM

Earnings per share is the net income of the company for the most recent 12 month period, divided by number of shares outstanding. This is the most common meaning of PE ratio if no other qualifier is specified. Monthly earning data for individual companies are not available, so the previous four quarterly earnings reports are used and EPS is updated quarterly. Note, companies individually choose their financial year so the schedule of updates will vary.

Trailing P/E from continued operations

Instead of net income, uses operating earnings which exclude earnings from discontinued operations, extraordinary items (e.g. one-off windfalls and write-downs), or accounting changes.

Forward P/E or Estimated P/E

Instead of net income, uses estimated net earnings over next 12 months. Estimates are typically derived as the mean of a select group of analysts (note, selection criteria is rarely cited). In times of rapid economic dislocation, such estimates become less relevant as "the situation changes" (e.g. new economic data is published and/or the basis of their forecasts become obsolete) more quickly than analysts adjust their forecasts.

Based on XYZ'S EPS of Rs. 101 for the year FY10, the trailing 12 month PE of XYZ at a price of Rs. 2200 per share works out to be 22X. If we come up with an estimated EPS of Rs. 120 for FY11 based on our analysis and assume the same PE multiple of 22X (Forward P/E) for the next year, then the target price works out to be (22 * 120) Rs. 2640.

4.7 Price / Book Value Ratio

A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share. It is also known as the "price-equity ratio".

$$P/B\ Ratio = \frac{Stock\ Price}{Total\ Assets - Intangible\ Assets\ and\ Liabilities}$$

A lower P/B ratio could mean that the stock is undervalued. However, it could also mean that something is fundamentally wrong with the company. As with most ratios, be aware that this varies by industry.

Price to book value ratio is a widely used ratio. It is necessary to estimate the end-year-book value per share for the next period. This can be derived from the historical growth rate by the sustainable growth formula (g=ROE*retention rate).

4.8 Enterprise Value/EBITDA Ratio

The enterprise value to EBITDA multiple is obtained by netting cash out against debt to arrive at enterprise value and dividing by EBITDA.

$$\frac{\text{Enterprise Value}}{\text{EBITDA}} = \frac{\text{Market Value of Equity} + \text{Market Value of Debt} - \text{Cash}}{\text{Earnings before Interest, Taxes and Depreciation}}$$

4.9 Price/Sales Ratio

The Internet boom of the late 1990s was a classic example of hundreds of companies coming to the market with no history of earning – some of them didn't even have products yet. Their stock prices soared only to come crashing down later. Fortunately, that's behind us.

However, we still have the problem of needing some measure of young companies with no earnings, yet worthy of consideration. After all, Microsoft had no earnings at one point in its corporate life.

One ratio you can use is Price to Sales or P/S ratio. This metric looks at the current stock price relative to the total sales per share. You calculate the P/S by dividing the market cap of the stock by the total revenues of the company.
You can also calculate the P/S by dividing the current stock price by the sales per share.

$$\frac{P}{S} = \frac{\text{Market Cap}}{\text{Revenues}}$$

or

$$\frac{P}{S} = \frac{\text{Stock Price}}{\text{Sales per Share}}$$

Much like P/E, the P/S number reflects the value placed on sales by the market. The lower the P/S, the better the value, at least that's the conventional wisdom. However, this is definitely not a number you want to use in isolation. When dealing with a young company, there are many questions to answer and the P/S supplies just one answer.

Price to sales ratio is relatively volatile in comparison to other ratios. This ratio is suitable for growth companies. A requirement for a growth company is strong consistent sales growth.

4.10 Special cases of Valuation

4.10.1 IPOs

Most firms conducting initial public offerings (IPOs) are young companies for which it is difficult to forecast future cash flows. Most of them are in pioneering stage or expansion stage and their revenues are highly volatile with very high growth rates which are unsustainable in the future. To value these companies, discounted cash flow analysis is very imprecise,

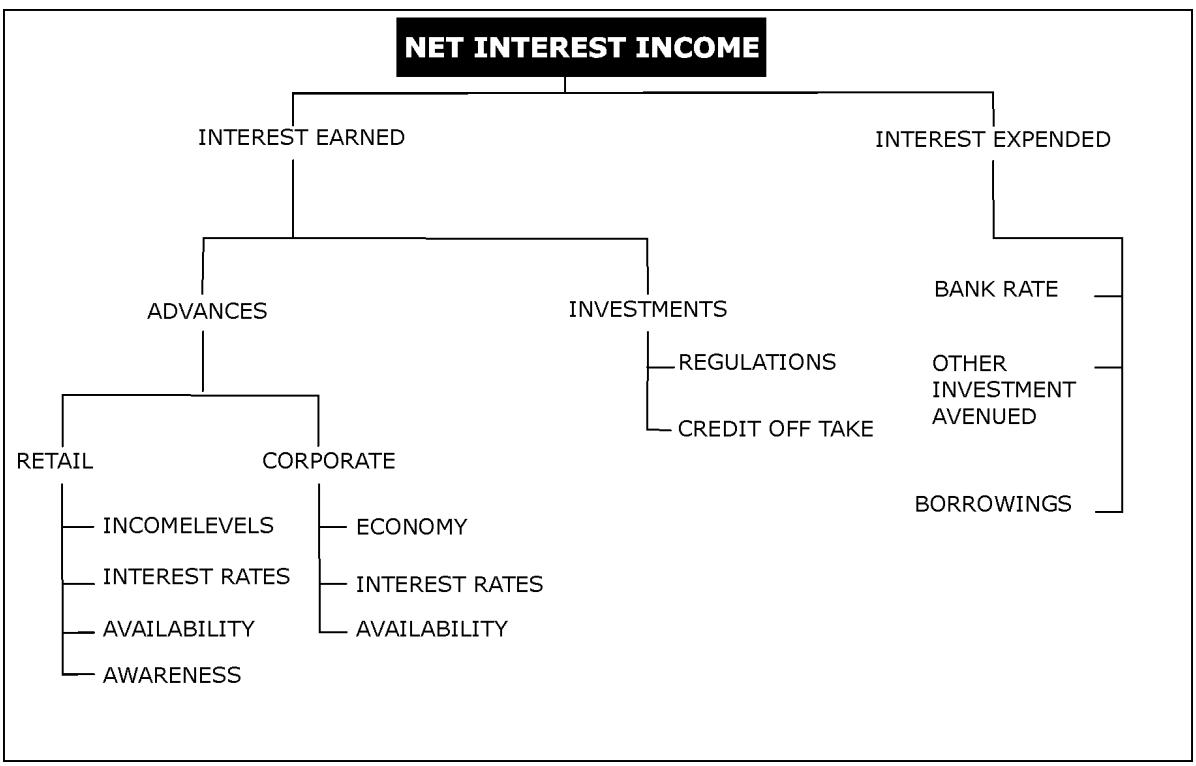
and the use of accounting numbers, in conjunction with comparable firm multiples, is widely recommended.

The data about the firm is also not widely available and the Draft Red Herring Prospectus (DRHP) is the only source of information of finances of the company. Relative valuation using multiples such as P/E (adjusted for leverage, growth rates) and EV/EBITDA are most commonly used for valuing IPOs. Here, we start with an already listed company and take its trading multiple as base. Then, we make adjustments for information availability (We generally reduce the multiple for non-availability of information about the company in the public domain due to its privately held nature), phase in the product development, size and growth rates.

Analysts face problems when companies which are pioneers in their industries and having new innovative but never-before-tested business models come to capital markets for raising capital. Due to their new business models, there are no comparable companies in the listed space. The dot com bubble and subsequent bust was an example of the market paying humungous multiples to new and innovative business models due to lack of complete understanding of the business. Valuing IPOs is thus a different ball-game altogether due to lack of information and comparable companies at times.

4.10.2 Financial Services firms

Unlike any other manufacturing or service company, a bank's accounts are presented in a different manner (as per banking regulations). The analysis of a bank account differs significantly from any other company. The key operating and financial ratios, which one would normally evaluate before investing in company, may not hold true for a bank (like say operating margins).



The primary business of a bank is to accept deposits and give out loans. So in case of a bank, capital (read money) is a raw material as well as the final product. Bank accepts deposits and pays the depositor an interest on those deposits. The bank then uses these deposits to give out loans for which it charges interest from the borrower.

Of the cash reserve, a bank is mandated to maintain a certain percentage of deposits with the Reserve Bank of India (RBI) as CRR (cash reserve ratio), on which it earns lower interest. Whenever there is a reduction in CRR announced in the monetary policy, the amount available with a bank, to advance as loans, increases which acts as a positive for Banks in healthy credit off-take scenario. The second part of regulatory requirement is to invest in Government Securities that is a part of its statutory liquidity ratio (SLR). The bank's revenues are basically derived from the interest it earns from the loans it gives out as well as from the fixed income investments it makes. If credit demand is lower, the bank increases the quantum of investments in Government Securities.

Apart from this, a bank also derives revenues in the form of fees that it charges for the various services it provides (like processing fees for loans and forex transactions). In developed economies, banks derive nearly 50% of revenues from this stream. This stream of revenues contributes a relatively lower 15% in the Indian context.

Having looked at the profile of the sector in brief, let us consider some key factors that influence a bank's operations. One of the key parameters used to analyse a bank is the Net Interest Income (NII). NII is essentially the difference between the bank's interest revenues and its interest expenses. This parameter indicates how effectively the bank conducts its lending and borrowing operations (in short, how to generate more from advances and spend less on deposits).

Interest revenues

Interest revenues = Interest earned on loans + Interest earned on investments + Interest on deposits with RBI.

Interest on loans:

Since banking operations basically deal with 'interest', interest rates prevailing in the economy have a big role to play. So, in a high interest rate scenario, while banks earn more on loans, it must be noted that it has to pay higher on deposits also. But if interest rates are high, both corporates and retail classes will hesitate to borrow. But when interest rates are low, banks find it difficult to generate revenues from advances. While deposit rates also fall, it has been observed that there is a squeeze on a bank when bank rate is soft. A bank cannot reduce interest rates on deposits significantly, so as to maintain its customer base, because there are other avenues of investments available to them (like mutual funds, equities, public savings scheme).

Since a bank lends to both retail as well as corporate clients, interest revenues on advances also depend upon factors that influence demand for money. Firstly, the business is heavily dependent on the economy. Obviously, government policies (say reforms) cannot be ignored when it comes to economic growth. In times of economic slowdown, corporates tighten their purse strings and curtail spending (especially for new capacities). This means that they will borrow lesser. Companies also become more efficient and so they tend to borrow lesser even for their day-to-day operations (working capital needs). In periods of good economic growth, credit off-take picks up as corporates invest in anticipation of higher demand going forward.

Similarly, growth drivers for the retail segment are more or less similar to the corporate borrowers. However, the elasticity to a fall in interest rate is higher in the retail market as compared to corporates. Income levels and cost of financing also play a vital role. Availability of credit and increased awareness are other key growth stimulants, as demand will not be met if the distribution channel is inadequate.

Interest on Investments and deposits with the RBI

The bank's interest income from investments depends upon some key factors like government policies (CRR and SLR limits) and credit demand. If a bank had invested in Government Securities in a high interest rate scenario, the book value of the investment would have appreciated significantly when interest rates fall from those high levels or vice versa.

Interest expenses

A bank's main expense is in the form of interest outgo on deposits and borrowings. This in turn is dependent on the factors that drive cost of deposits. If a bank has high savings and current deposits, cost of deposits will be lower. The propensity of the public to save also plays a crucial role in this process. If the spending power for the populace increases, the need to save reduces and this in turn reduces the quantum of savings.

Key parameters to keep in mind while analysing a banking stock

As we had mentioned earlier, cash is the raw material for a bank. The ability to grow in the long-term therefore, depends upon the capital with a bank (i.e. capital adequacy ratio). Capital comes primarily from net worth. This is the reason why price to book value is important. As a result, price to book value is important while analysing a banking stock rather than P/E. But deduct the net non-performing asset from net worth to get a true feel of the available capital for growth.

Before jumping to the ratio analysis, let's get some basic knowledge about the sector. The Banking Regulation Act of India, 1949, governs the Indian banking industry. The banking system in India can broadly be classified into public sector, private sector (old and new) and foreign banks.

The government holds a majority stake in public sector banks. This segment comprises of SBI and its subsidiaries, other nationalized banks and Regional Rural Banks (RRB). The public sector banks comprise more than 70% of the total bank branch network in the country.

Old private sector banks have a largely regional focus and they are relatively smaller in size. These banks existed prior to the promulgation of Banking Nationalization Act but were not nationalized due to their smaller size and regional focus.

Private Banks entered into the sector when the Banking Regulation Act was amended in 1993 permitting the entry of new private sector banks. Foreign banks have confined their operations to mostly metropolitan cities, as the regulations restricted their operations. However, off late, the RBI has granted approvals for expansions as well as entry of new foreign banks in order to liberalize the system.

Now let's look at some of the key ratios that determine a bank's performance.

4.10.3 Net interest margin (NIM):

For banks, interest expenses are their main costs (similar to manufacturing cost for companies) and interest income is their main revenue source. The difference between interest income and expense is known as net interest income. It is the income, which the bank earns from its core business of lending. Net interest margin is the net interest income earned by the bank on its average earning assets. These assets comprises of advances, investments, balance with the RBI and money at call.

$$\text{NIM} = \frac{\text{Interest income} - \text{Interest expenses}}{\text{Average earning assets}}$$

Operating profit margins (OPM)

Banks operating profit is calculated after deducting administrative expenses, which mainly include salary cost and network expansion cost. Operating margins are profits earned by the bank on its total interest income. For some private sector banks the ratio is negative on account of their large IT and network expansion spending.

$$\text{OPM} = \frac{\text{Net interest income (NII)} - \text{Operating expenses}}{\text{Total interest income}}$$

Cost to income ratio

Controlling overheads are critical for enhancing the bank's return on equity. Branch rationalization and technology upgrade account for a major part of operating expenses for new generation banks. Even though, these expenses result in higher cost to income ratio, in long term they help the bank in improving its return on equity. The ratio is calculated as a proportion of operating profit including non-interest income (fee based income).

$$\text{Cost to income ratio} = \frac{\text{Operating expenses}}{\text{NII} + \text{Non} - \text{interest income}}$$

Other income to total income

Fee based income account for a major portion of the bank's other income. The bank generates higher fee income through innovative products and adapting the technology for sustained service levels. This stream of revenues is not depended on the bank's capital adequacy and consequently, potential to generate the income is immense. The higher ratio indicates increasing proportion of fee-based income. The ratio is also influenced by gains on government securities, which fluctuates depending on interest rate movement in the economy.

Credit to deposit ratio (CD ratio)

The ratio is indicative of the percentage of funds lent by the bank out of the total amount raised through deposits. Higher ratio reflects ability of the bank to make optimal use of the available resources. The point to note here is that loans given by bank would also include its investments in debentures, bonds and commercial papers of the companies (these are generally included as a part of investments in the balance sheet).

Capital adequacy ratio (CAR)

A bank's capital ratio is the ratio of qualifying capital to risk adjusted (or weighted) assets. The RBI has set the minimum capital adequacy ratio at 10% as on March 2002 for all banks. A ratio below the minimum indicates that the bank is not adequately capitalized to expand its operations. The ratio ensures that the bank do not expand their business without having adequate capital.

$$\text{CAR} = \frac{\text{Tier I capital} + \text{Tier II capital}}{\text{Risk weighted assets}}$$

NPA ratio: The 'net non-performing assets to loans (advances) ratio' is used as a measure of the overall quality of the bank's loan book. Net NPAs are calculated by reducing cumulative balance of provisions outstanding at a period end from gross NPAs. Higher ratio reflects rising bad quality of loans.

$$\text{NPA ratio} = \frac{\text{Net non} - \text{performing assets}}{\text{Loans given}}$$

Provision coverage ratio

The key relationship in analysing asset quality of the bank is between the cumulative provision balances of the bank as on a particular date to gross NPAs. It is a measure that indicates the extent to which the bank has provided against the troubled part of its loan portfolio. A high ratio suggests that additional provisions to be made by the bank in the coming years would be relatively low (if gross non-performing assets do not rise at a faster clip).

$$\text{Provision coverage ratio} = \frac{\text{(Cumulative provisions)}}{\text{Gross NPAS}}$$

The banking sector plays a very vital role in the working of the economy and it is very important that banks fulfil their roles with utmost integrity. Since banks deal with cash, there have been cases of mismanagement and greed in the global markets. And hence, investors need to check up on the quality of management.

4.10.4 Firms with negative cash flows

For firms with negative cash flows (generally during the capital expenditure mode), we can clearly not use the DDM and the FCFE for discounting cash flows. Relative valuation methods such as PE and EV/EBITDA also fail in the valuation of EBITDA negative companies. The most accepted methods of valuation in such companies are FCFF and P/B methods. In case of certain companies, innovative methods like P/Sales and P/Consumer, etc. are also used. Many a times loss making but asset heavy businesses are valued by SOTP method based solely on valuing their assets (such as land banks for some textile mills) on as-is basis.

4.10.5 Acquisition Valuation

At times different businesses bid for others in their own or other industries. Many a times, the motive behind these acquisitions is to make use of possible synergies between the businesses to create value. For example, an apparel manufacturing company may get into retailing in order to get vertically integrated and make additional margins on its business as a whole. Similarly, a steel manufacturer may acquire a coal mine in order to secure fuel supply for its operations. During such times, acquisition of the target company may be strategically very important for the acquirer and thus the acquirer may pay a premium over its intrinsic value. Sometimes the acquirer gets a control of the target and uses its management and operational execution expertise to generate more value. In such cases, the additional price paid by the acquirer to get control is termed as the control premium. Such a premium is generally seen to be given to a majority shareholder of the target which currently has the controlling stake in the target. Another such premium given is for non-compete clause. This clause makes sure that the management and promoters of the target company do not start another such similar businesses in direct competition with the acquirer for a specified amount of time.

4.10.6 Distressed Companies

Distressed securities are securities of companies or government entities that are either already in default, under bankruptcy protection, or in distress and heading toward such a condition. When companies enter a period of financial distress, the original holders often sell the debt or equity securities of the issuer to a new set of buyers. In recent years, private investment partnerships such as hedge funds have been the largest buyers of distressed securities. Other buyers include brokerage firms, mutual funds, private equity firms, and specialized debt funds

(such as collateralized loan obligations) are also active buyers. Investors in distressed securities often try to influence the process by which the issuer restructures its debt, narrows its focus, or implements a plan to turn around its operations. The US has the most developed market for distressed securities. Other international markets (especially in Europe) have become more active in recent years as the amount of leveraged lending increased, capital standards for banks have become more stringent, the accounting treatment of non-performing loans has been standardized and insolvency laws have been modernized. Investors in distressed securities typically must make an assessment not only of the issuer's ability to improve its operations but also whether the restructuring process (which frequently requires court supervision) might benefit one class of securities more than another.

During the recent crisis, we saw many Indian real estate companies trading at historic lows on account of being highly leveraged and having lack of cash flows to support such leverage. These companies then saw many rounds of equity infusion through QIP route and restructured/ refinanced or repaid their debt. This, however, presented an opportunity for investors to invest in such companies at fairly low levels and see the prices appreciate as these companies improved their cash flows and mended their debt levels. Investing in distressed companies involves a fair amount of judgement about the future path of the company, availability of sustained financing, improved business conditions and residual value of assets, etc.

(Model test paper for the module is available on the
website **www.nseindia.com > 'Education' > 'Prepare for a Testing' link)**