

Question Paper

Security Analysis – II (212) : October 2005

Section D : Case Study (50 Marks)

This section consists of questions with serial number 1 - 5.
Answer all questions.
Marks are indicated against each question.
Do not spend more than 80 - 90 minutes on Section D.

Case Study

Read the case carefully and answer the following questions:

1. Evaluate and comment on the competitive structure of the Indian Banking industry.
(10 marks) [< Answer >](#)
2. Determine the share price of Lead Bank Ltd. as on March 31, 2005, based on the two-stage Free Cash Flow to Equity model (FCFE). Free cash flow is expected to grow at 12% for the next three years and at 6% thereafter. (Capital expenditure, depreciation and working capital are expected to increase proportionately with FCFE).
(12 marks) [< Answer >](#)
3. Compare the Dividend Discount Model (DDM) with FCFE model with respect to different characteristics attached with them.
(8 marks) [< Answer >](#)
4. Test whether the stock price movement of Lead Bank Ltd. during March 05 to July 05 exhibits semi-strong form of efficiency based on residual analysis. The closing prices during the respective months for Lead bank and S&P CNX Nifty are as follows:

End of	Lead Bank share price (Rs.)	S&P CNX Nifty
March 05	108.00	2035.65
April 05	93.20	1902.50
May 05	99.90	2087.55
June 05	94.30	2220.60
July 05	109.80	2312.30

5. a. Comment on whether the stock should be bought, sold or held at point A, B, C, D and E based on the share price chart given in annexure III.
b. Explain the support and resistance levels and the important principles to be considered while using support and resistance lines for trend analysis.
(5 + 5 = 10 marks) [< Answer >](#)

Indian Banking Industry

India had its first bank set up in 1786. That is General Bank of India. Then in 1865 Allahabad bank became the first bank exclusively owned by Indians. Reserve Bank of India came in 1935. Indian banking industry can be described in three stages. Banking industry before 1969, 1969 to 1991 and after 1991. Government regularly took major steps in banking reforms from time to time. Starting from independence, it nationalized the Imperial Bank of India in 1955. Government promoted State Bank of India as a principal agent of RBI and to handle banking transactions of the Union and State Governments all over the country. But since 1969, Government's regulatory policy for Indian bank, with the nationalization of 14 major private banks of India has paid rich dividends. In the year 1980, 80% of banking control is under government control. Nationalization gave the public unspoken assurance and enormous confidence about the sustainability of these organizations.

Sectoral snap

For, the past three decades India's banking system has several outstanding achievements to its credit. The most salient is its extensive reach. It is no longer restricted to only metropolitans or cosmopolitans in India. In fact, Indian banking system has reached even to the remote corners of the nation. This is one of the main reasons of

India's growth process. After the liberalization in 1991, banking sector has introduced many products and services. The entire banking industry has become handy and speedy. Efforts are being put to give a satisfactory service to customers. Time is given more importance than money. Lot of foreign banks came up and increasing number of ATM's shows the confidence level. The favorable government policies for enhancing limits of foreign investments to 49 per cent are the key initiatives that have encouraged the industry. Larger banks will be able to mobilize sufficient capital to finance asset expansion and fund investments in technology. Thus Indian banking industry has shown a great deal of buoyancy.

The Indian Banking system has a large geographic and functional coverage. The asset size of Indian banking system has increased and so are the deposits with the network of around 66000 branches all over the country. Of all segments in banking industry, corporate banking is the largest segment and retail banking is the fastest growing segment. Retail has continued to be the key driver for a strong growth in industry. Whereas lately, corporate credit has also shown signs of picking up. Agricultural finance in the banking industry plays a major role. Dependence on monsoon plays a major role on agricultural output. NPAs of bank are also affected due to agricultural lending. Credit-deposit ratio also plays a vital role in banks performance. The banks performance depends on the cost of the deposits and the interest margins.

Public and Private sector banks would continue to have a co-existence. Most of the private sector bank's operate in the urban and the semi-urban towns and cities. As a result they serve only the crème of the market. But if India excludes public sector banks, rural and semi urban branches, we will be surprised to see that there is hardly any difference in the productivity of public and private sector banks. Earlier the private sector bank's had an upper hand with technological advancement. However, as most public sector banks have embarked upon major technological up-gradations, the gap will narrow rapidly and the competitive position of public sector banks will improve significantly.

Banking Makeover

The financial sector has always had a good time in the Indian markets, as it is one of the growing and undervalued sectors. A lot of foreign investments are coming in this sector. The major reason has been the presence of a strong system. After the American and the European markets, India has a fairly robust banking system in the world. This is bound to attract foreign participation not only through portfolio investments, but also through strategic investments.

The emphasis has been on safeguarding the financial stability of the overall system through effective monitoring and assurance of implementation of regulations. In this direction, the overall approach has been that of reorienting the role of RBI for improving institutional soundness, strengthening the regulatory and supervisory processes in alignment with global best practices and developing the necessary technological and legal infrastructure. While the approach towards the reforms has been gradual and relevant to the context, consultative processes and appropriate sequencing of measures have succeeded in aiding development, avoiding crises, enhancing efficiency and imparting resilience to the system. The aim is to move towards a system that is responsive to the needs of the common person.

The Indian Banking industry is currently in a phase of transformation with many structural changes taking place. Over the last few years, bank's are making profits on their treasury books. The future would see bank's making profits from their core operations of lending as well as non-fund based activities. The banks that can maintain their net interest margins would sustain strong core operating performance. This coupled with industry's stress on fee income would improve operating profits. The NPA level has come down significantly and provisioning requirements are expected to be low. With most industries turning around, fresh slippages would be less. With a 60-day notice, banks can acquire the assets of defaulters. Defaulters are allowed to appeal only after paying 25-50% of the total amount. The technology difference between the Public and Private banks is narrowing, which would intensify competition. Consolidation in the industry is bound to happen and with government backing, it would gather pace. Consolidation would be triggered to improve operational and/or geographical scale. India has a lot of regional banks, which could be the main factor for players to increase size to have an overall presence.

An unwavering and well-organized financial sector is essential for sustained economic development. The annual policy Statements and mid-term reviews of RBI continuously focuses on the developmental and regulatory measures to strengthen the financial system.

Lead Bank Ltd.

The Bank was incorporated on 20th November 1933 and commenced business on 28th November 1933 with a paid up capital of Rs 1.00 lakh and an authorized capital of Rs 10.00 lakhs. Dr. Pritam Sinha founded the Lead Bank. The Bank's Total Business as on 30.06.2005 stood at Rs.43,758 Crores and the Bank is rendering services through 1683 Business Delivery Channels, consisting of 1,173 Branches, 137 Extension Counters, 335 ATMs

and 38 Satellite Branches; spread over 21 States and 2 Union Territories as at the end of June 2005. The Bank has entered into ATM Sharing Arrangements with various banks, thus offering over 9,000 ATMs spread across the Country for use by Customers. Instant Funds Transfer Facility is provided through 664 Branches.

Lead Bank, in its constant effort to provide its customers with innovative technological services, has introduced Lobby Banking (Multimedia Touch Screen Kiosks) in 65 branches so far. This touch screen kiosk enables the customers to access a range of information regarding their accounts. The non-customer public can obtain general information. Basically the Lobby Banking facility is an additional information source to the customer and public. The Corporate Customers are provided the facility of Internet Banking from their Offices. This facility is also an information facility. Lead Bank also issues Credit Cards in India since 1984. Bank issues four types of cards namely - Visa Classic, Visa Gold, MasterCard and MasterCard Electronic. All these cards are accepted in India & Nepal at Merchant establishments, which display VISA/MasterCard acceptance symbol. Further VISA Gold Cards are accepted at 50,000 visa merchant outlets in India and millions worldwide.

Annexure I
Profit & loss account
Lead Bank Ltd.

(Rupees in million)		
Particulars	Year ending	Year ending
INCOME		
INTEREST EARNED	22,735	22,273
OTHER INCOME	7,533	6,780
TOTAL	30,268	29,053
EXPENDITURE		
INTEREST EXPENDED	12,044	13,167
OPERATING EXPENSES (includes depreciation of Rs.600 million and	8,295	6,584
PROVISIONS AND CONTINGENCIES (includes taxes of Rs.2228	4,728	4,667
TOTAL	25,067	24,418
PROFITS		
NET PROFIT	5,201	4,635
PROFIT BROUGHT FORWARD	2	2
TOTAL	5,203	4,637
APPROPRIATIONS		
Transfer to Statutory Reserve	1,300	1,159
Transfer to Revenue & Other Reserves	2,544	2,213
Provision for Proposed Dividend	1,200	1,120
Tax on Dividend	157	143
Balance carried over to Balance Sheet	2	2
TOTAL	5,203	4,637

Lead Bank Ltd.

Balance sheet

(Rupees in million)

Total	327,287	270,089
Assets		
Cash and balances with Reserve Bank of India	20,739	20,446
Balances with Banks and Money at call and short notice	14,494	5,286
Investments	106,463	103,173
Advances	175,168	128,855
Fixed Assets	1,873	1,799
Other Assets	8,550	10,530
Total	327,287	270,089
Contingent Liabilities	149,808	56,198
Bills for Collection	33,314	19,453

Required rate of return on equity is 14% and Industry P/E is 11.

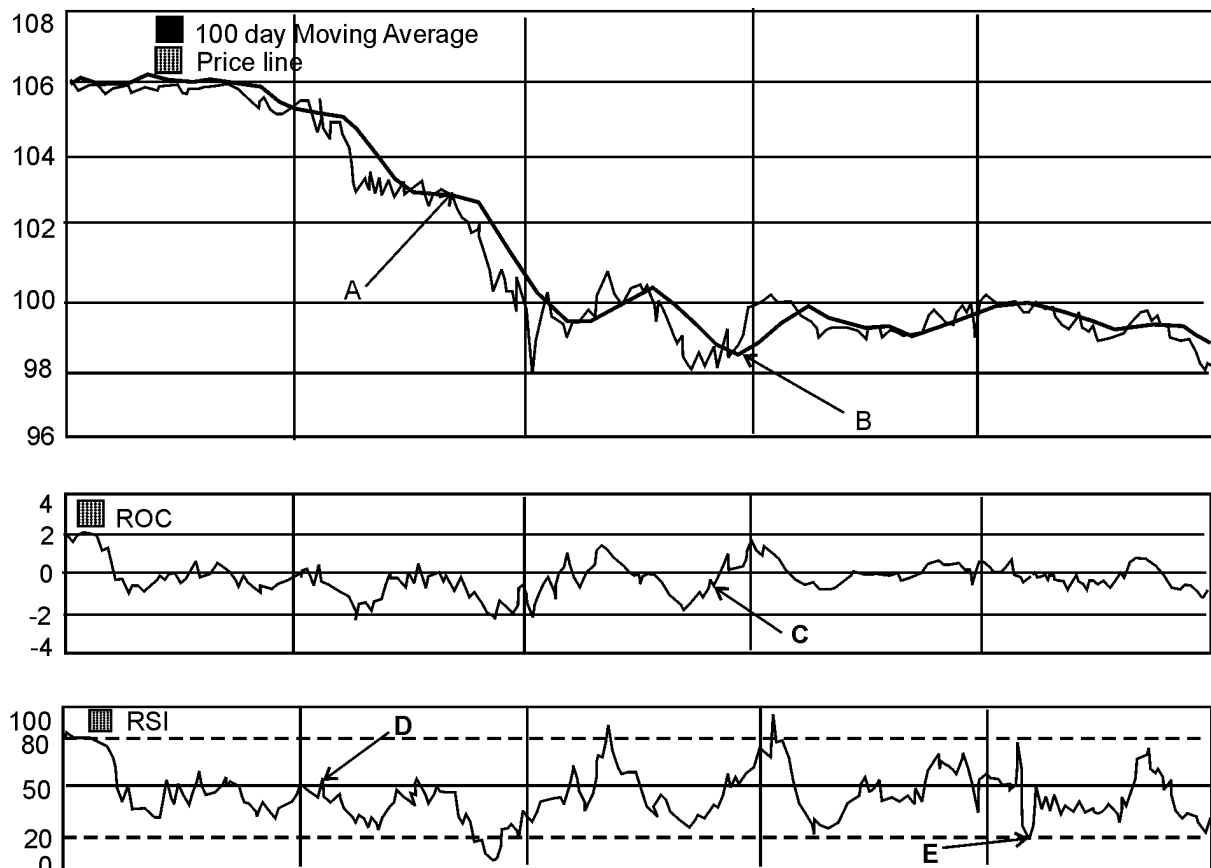
Annexure II

Share price of Lead Bank Ltd. and S&P CNX Nifty

End of Month	Share price of Lead Bank Ltd. (Rs.)	S&P CNX Nifty
March 2004	50.60	1771.90
April 2004	61.10	1796.10
May 2004	41.60	1483.60
June 2004	42.60	1505.60
July 2004	46.00	1632.30
August 2004	43.50	1631.75
September 2004	49.65	1745.50
October 2004	49.20	1786.90
November 2004	69.85	1958.80
December 2004	89.35	2080.50
January 2005	84.25	2057.60
February 2005	92.50	2103.25

Annexure III

Technical Charts for the Lead Bank Ltd.



END OF SECTION D

Section E : Caselets (50 Marks)

This section consists of questions with serial number 6 - 11.

Answer **all** questions.

Marks are indicated against each question.

Do not spend more than 80 - 90 minutes on Section E.

Caselet 1

Read the caselet carefully and answer the following questions:

6. What are the important principles to be borne in mind, while analyzing price patterns in technical analysis?
(8 marks) [< Answer >](#)
7. What are the pitfalls in charting and in its interpretation? Explain.
(8 marks) [< Answer >](#)

Two basic principle of technical analysis are - price trend and that history repeats itself. An up trend indicates that the forces of demand are in control and a downtrend that the forces of supply are in control. However, prices do not trend forever and as the balance of power alters, a chart pattern begins to appear. Certain patterns, such as a parallel channel, denote a strong trend. However, the vast majority of chart patterns fall into two main groups: reversal and continuation. Reversal patterns point out a change of trend and can be broken down into top and bottom formations.

It is a well-known notion among financial analysts that price moves in patterns and these patterns can be used to anticipate future price. As the definitions of these patterns are often subjective, every analyst has a need to characterize and explore meaningful patterns from historical time series quickly and efficiently. However, such discovery process can be extremely arduous and technically challenging in the absence of a high-level pattern interpretation language.

Charting market movements is one of the most popular means investors use to make out share market trends. A chart of price information is not a way to predict the future behavior of the market, or of a stock. A chart of traded prices for a stock tells us very little about the financial health of a company, or the value of a company as it is related to its financial position. Although price is used in some fundamental calculations like the PE ratio, this has nothing to do with the way a price chart is used. The single most misleading and false idea about charting is that somehow it is able to predict the future. It is an idea repeated unendingly by those who know little about charting. People who are new to the market accept that this idea set off on an unproductive, and sometimes very costly, chase in search of the method that allows them to forecast the future. It is simply a graphical record of the traded price for a stock during the day. The simplest display is a line chart, which usually shows the closing price for each day. This is useful as a way of seeing how prices have behaved over the preceding weeks or months. The display gives a wide outline of the direction of the trend because we can see if price is generally moving up or down. The price chart tells us first about the sentiment of the mass. It does not tell us about the health of the company, the quality of its management, or the importance of its product line or services. The price chart does tell us what other traders and investors think about these aspects of company behavior.

Caselet 2

Read the caselet carefully and answer the following questions:

8. Explain the effect on the price of a call option and a callable bond compared to a non callable bond, with respect to changes in the interest rate.

(8 marks) < [Answer](#) >

9. How is option adjusted duration defined? Explain the important factors influencing option adjusted duration.

(9 marks) < [Answer](#) >

Investors in IDBI's Flexibonds-96, who dreamt to become lakhpathi, were disappointed, as IDBI had decided to exercise its call option on the bonds issued in March 1996. IDBI had issued a long term Deep Discount Bond in the year 1996 for Rs. 5,300, which was going to give two lakhs of rupees after 25 years. They exercised an early redemption option in 2000. The deemed early redemption value was Rs 10,000. All holders of this bond had to redeem their bonds and receive Rs 10,000 as against the two lakh rupees, which was due to them after 25 years from the date of issue. This move, helped IDBI to save over Rs.100 crores in interest cost annually over the rest of the life of bonds, that is, about 20 years. Also, it was a trend setter for other financial institutions such as ICICI, IFCI and other corporates.

The IDBI deep discount bond was a zero coupon bond with a redemption value at the end of 25 years of Rs 200,000 and an issue price of Rs 5,300. The investors had four European styles put options allowing them to redeem the bond at Rs 10,000, Rs 25,000, Rs 50,000 and Rs 100,000 respectively at the end of 4 years and 4 months, 10 years and 8 months, 15 years and 5 months, and 20 years and 2 months respectively. The issuer (IDBI) also had four European styles call options with the same exercise dates and exercise prices as the put options.

Actually, this bond with all its eight embedded options can be valued quite simply without using any option-pricing model at all. An important relationship known as the put-call parity implies that this bond is actually nothing but a simple discount bond with a maturity value of Rs 10,000 at the end of 4 years and 4 months. This is because the bond will be extinguished on that date either by the investors exercising their put option or by the issuer exercising its call option. Whatever the yield curve may look like at the end of 4 years and 4 months, one of these two options will be worth exercising.

The main reason a bond is called is a drop in interest rates. At such a time, issuers evaluate their outstanding loans, including bonds, and consider ways to cut costs. If they feel it is advantageous for them to retire their current bonds and secure a lower rate by issuing new bonds, they may call their bonds. If your callable bond pays at least 1% more than newer issues of identical quality, it is likely a call could be forthcoming in the near future.

When the bond is called, you might end up losing money, even though the issuer might pay you a bonus. In addition, you might not be able to reinvest the cash at a similar rate of return, which can disturb your portfolio. At such a time, you as a bondholder should examine your portfolio to prepare for the possibility of losing that high-yielding asset. However, there is one feature that you want to look for in a callable bond, i.e. Call Protection. This means there's a period during which the bond cannot be called, allowing you to enjoy the coupons regardless of interest rate movements.

There is no way to prevent a call. But with some planning, you can ease the pain before it happens to your bond.

Make sure you understand the call features of a bond before you buy it, and look for bonds with call protection. This could give you some time to evaluate your holding if interest rates experience a decline. Finally, to determine whether a callable bond actually offers you a higher yield, find bonds that are non-callable and compare their yields to callable ones. On the other hand, locating bonds without call features might not be easy. According to Thomson Financial, about 78% of new municipal bonds sold in U.S. in 2004 are callable.

One of the challenges investors face in comparing the attractiveness of fixed income investment verses another is the effects of embedded options. For example, if two investments are being compared, one of which is callable and the other of which is not, it is not meaningful to compare their respective yields. Traditionally, investors made little attempt to adjust their analysis of fixed income instruments to recognize the effects of embedded options. There were several reasons for this: The structuring of fixed income instruments was more uniform than it is today. For example, most of the corporate bonds were callable. The callable instrument's yield will be inflated to compensate investors for the short call option embedded in the instrument. For this reason, yield is a poor indication of the expected return from such an instrument. Fixed income instruments are compared, no longer according to their absolute yields, but according to their "option-adjusted spreads."

Caselet 3

Read the caselet carefully and answer the following questions:

10. What are the factors to be considered in mind before estimating the capitalization rate?

(9 marks) [< Answer >](#)

11. How is growth rate estimated under DDM approach? Describe the factors that influence the value of growth?

(8 marks) [< Answer >](#)

Doing basic fundamental valuation is quite straightforward; all it takes is a little time and energy. The goal of analyzing a company's fundamentals is to find a stock's intrinsic value, a fancy term for what you believe a stock is really worth - as opposed to the value at which it is being traded in the marketplace. If the intrinsic value is more than the current share price, your analysis is showing that the stock is worth more than its price and that it makes sense to buy the stock.

Although there are many different methods of finding the intrinsic value, the premise behind all the strategies is the same: a company is worth the sum of its discounted cash flow. This means that a company is worth all of its future profits added together.

When you worth a stock of a company, the subsequent place that you should visit for information is the company's own Web site. At this site you can get the corporation's annual report, which contains its balance sheet, income statement and cash flow statement, and its latest quarterly earnings release. This will supply you with the bulk of the information that you need for valuing its stock. Various ratios can also be calculated from these data. The annual rate of return that an investor expects to earn when investing in shares of a company is known as the cost of equity. That return is composed of the dividends paid on the shares and any increase (or decrease) in the market value of the shares. For valuing a stock through most of the model, capitalization rate is the most essential component. The importance of obtaining a good measure of cost of capital stems from the fact that firms and investors need to make investment decisions based on these estimates. Rate of return to be earned is estimated by forecasting the growth rate of the company.

Growth rate possesses a great importance in valuing a stock of a company. Growth is described in various ways such as stable growth, normal growth and supernormal growth. Many investors and financial commentators believe that high earnings growth rates and high rates of return are synonymous. This is false. What is true is that differences in earnings growth rates influence the breakdown of expected rates of return into their capital gain and dividend components. A higher rate of earnings growth produces relatively more capital appreciation and less dividend yield. But earnings growth does not affect expected total rates of return.

However, it is difficult to specify the growth rate with precision since the growth rate is related with various other micro and macro factors. Growth estimates varies from analysts to analysts. Theoretically, growth companies refer to firms whose sales and earnings are expected to grow more rapidly than inflation. If the growth rate is higher than the required rate of return, then the value of the stock become negative, in DDM approach. A firm cannot grow in the long-term at a rate significantly greater than the growth rate in the economy. Under such situation, it is better to shift from DDM approach to two-stage or three-stage model.

END OF SECTION E

Suggested Answers Security Analysis-II (212): October 2005

Section D : Case Study

1. Michael Porter Analysis of Indian Banking Industry:

Threat of entry:

- India is a fast growing nation and many foreign banks are coming here to reap some benefit out of it, which is a big threat for entry to existing banks.
- Existing firms have strong presence and name. A unique identification is available for their name in market. The product differentiation of established firms creates entry barrier to new firm.
- The industry is capital intensive, and a compulsory maintenance of capital adequacy is there, which acts as a barrier to entry.
- Access to distribution channels and economies of scales of established players in the market also increases entry barrier.
- Government policy of increment in FDI, may attract some big players in the banking industry.
- Reforms and policies of government are the major determinant for deciding the level of entry barrier in the Indian banking industry.

Overall, entry barrier is moderate in this industry.

(Here supplier and buyer for the industry are the same persons as banks are only the mediator in the industry.)

Bargaining power of buyers:

- Big corporate and companies who have big transactions between them as well as various services may have some bargaining power.
- Individual buyers (retailers) have less bargaining power.
- Agricultural credit forms a major part of bank's credit and due to government support (depending on monsoon), customers of these segment have good bargaining power.

Bargaining power of suppliers:

- Main supplier of money in the banking industry is retailers and corporate. Bargaining power depends on the demand and supply of money in the market.
- Inter-bank market (money market) is also considered to be the supplier. In times when demand of money is high, costs of funds are high and vice versa.
- Bargaining power of supplier also depends on the creditworthiness of banks and their financial position. Thus if the bank is strong in its financials, then bargaining power of supplier is relatively less and the reverse is also true.

Threat of substitutes:

- Substitutes for banks are local moneylenders and hundiwalas, financial companies and NBFC's. Local moneylenders and hundiwalas come under unorganized sector. Finance companies and NBFC's come under organized sector. Unorganized sector in India has vast coverage in small villages and towns but due to increasing network of banks and their reliability, the unorganized sector is decreasing its business. The Finance companies and NBFC's have good products to offer to people and have good services as well. Thus, overall power of substitute is moderate.

Competitive Rivalry

Banking industry has two things to capitalize on. One is economies of scale and other spread margin. For achieving economies of scale, a large market share is needed and due to number of players there is intense competition. Presence of many Indian and foreign banks and their strive for higher market share will increase the competitive rivalry among existing players.

Various innovative products and services lead to an inevitable marketing war between the banks.

2. Lead bank's Free Cash Flow to Equity for the year 2004 - 2005 is calculated as follows:
(in millions)

Net income	5201
Plus: Depreciation	600
Less: capital expenditure	674
Less: Investment in working capital	1652
FCFE	3475

Note:

- Capital expenditure = $(1873 + 600) - 1799 = 674$
- Working capital calculation:

For the year ending 31-3-2005

(Rs. in million)

Cash& balances with RBI	20739
Balances with banks & money at call & short notice	14494
Other assets	8550
Current assets	43783
Other liabilities & provision	23577
Net Working capital	20206

For the year ending 31-3-2004

(Rs. in million)

Cash& balances with RBI	20466
Balances with banks & money at call & short notice	5286
Other assets	10530
Current assets	36282
Other liabilities & provision	17728
Net Working capital	18554

Investment in working capital = $20206 - 18554 = 1652$

(Rs. in million)

	2005	2006	2007	2008	2009
Growth rate		12%	12%	12%	6%
Net profit	5201	5825.12	6524.13	7307.03	7745.45
Plus: Depreciation expenses	600	672.00	752.64	842.96	893.53
Less: Capital expenditure	674	754.88	845.47	946.92	1003.74
Less: Increase in working capital	1652	1850.24	2072.27	2320.94	2460.20
FCFE	3475	3892	4359.04	4882.1248	5175.05
Terminal value				64688.13	
Total cash flow to equity				69570.25	
Discounted value		3414.04	3354.11	46957.94	
Total Discounted value of cash flow				53726.09	

Current value per share is Rs.134.32

- Discounting dividends usually provides the most conservative estimate of value for the equity in any firm, since most firms pay less in dividends than they can afford to. The dividend discount model is based upon the premise that the only cash flows received by stockholders are dividends. The DDM includes expected dividends for valuing common stock.

But FCFE model includes the residual cash flow, which is left after all financial and investment needs are met. FCFE is the cash flow available to the company's common equity holders after all operating expenses, interests, and principal payments have been paid and necessary investments in working capital and fixed capital have been made. Thus Free cash flow model take into consideration investment and financing policies as well as its dividend policy. Free cash flow to firm is good valuation technique for the stock, which doesn't, pays dividends and the firm whose profitability depends on the cash flow received by them. Further, unlike dividends, FCFE are not published and directly available data. Analysts need to compute these figures from available financial information, which involve a clear understanding of free cash flow as well as the ability to interpret and make use of the information appropriately.

The value of equity, based upon the free cash flow to equity, will therefore yield a more realistic estimate of value for equity, especially in the context of a takeover. In case of taking over the company, the DDM does not have much relevance as dividend can be changed as soon as the company is acquired. Thus in such FCFE is a economically sound valuation model. Even if a firm is not the target of a takeover, it can be argued that the value of equity has to reflect the possibility of a takeover, and hence the expected free cash flows to equity.

Both these models have two distinct growth phases. Firstly a finite growth period which has abnormal growth rate and secondly, an infinite growth period which has stable growth rate. Calculating growth rate has limitation with respect to its assumptions.

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4.

Return from Lead Bank Ltd. (%)	Return from S&P CNX Nifty (%)	$(Y - \bar{Y})$	$(X - \bar{X})$	$(Y - \bar{Y})^2$	$(X - \bar{X})^2$	$(Y - \bar{Y})(X - \bar{X})$
20.75	1.37	12.6	-0.04	158.7600	0.0016	-0.504
-31.91	-17.40	-40.06	-18.81	1604.8036	353.8161	753.5286
2.40	1.48	-5.75	0.07	33.0625	0.0049	-0.4025
7.98	8.42	-0.17	7.01	0.0289	49.1401	-1.1917
-5.43	-0.03	-13.58	-1.44	184.4164	2.0736	19.5552
14.14	6.97	5.99	5.56	35.8801	30.9136	33.3044
-0.91	2.37	-9.06	0.96	82.0836	0.9216	-8.6976
41.97	9.62	33.82	8.21	1143.7924	67.4041	277.6622
27.92	6.21	19.77	4.8	390.8529	23.0400	94.896
-5.71	-1.10	-13.86	-2.51	192.0996	6.3001	34.7886
9.79	2.22	1.64	0.81	2.6896	0.6561	1.3284
16.76	-3.21	8.61	-4.62	74.1321	21.3444	-39.7782
97.75	16.92			3902.6017	555.6162	1164.4894

$$\bar{Y} = \frac{\Sigma Y}{n} = \frac{97.75}{12} = 8.15\%$$

$$\bar{X} = \frac{\Sigma X}{n} = \frac{16.92}{12} = 1.41\%$$

$$\sigma_y^2 = \frac{\Sigma(Y - \bar{Y})^2}{n-1} = \frac{3902.6017}{11} = 354.78(\%)^2$$

$$\sigma_x^2 = \frac{\Sigma(X - \bar{X})^2}{n-1} = \frac{555.6162}{11} = 50.51(\%)^2$$

$$\text{Cov}_{xy} = \frac{\Sigma(X - \bar{X})(Y - \bar{Y})}{n-1} = \frac{1164.4894}{11} = 105.86 (\%)^2$$

$$\text{Beta} = \frac{105.86}{50.51} = 2.0958$$

Mean return from Telco = 8.15%

Mean return from S&P CNX 500 = 1.41%

If the characteristic line is $\alpha + \beta R_m$

$$\begin{aligned}\alpha &= 8.15 - (2.0958 \times 1.41) \\ &= 5.195\%\end{aligned}$$

Hence, the characteristic line of Philips is

$$R_p = 5.195 + 2.0958 R_m$$

Month	Actual Return (%)	Expected Return (%) (5.195+2.0958R _m)	Return from Market (%)	Abnormal Return (%)
April 05	-13.70	-8.51	-6.54	-5.19
May 05	7.19	25.59	9.73	-18.40
June 05	-5.61	18.55	6.37	-24.16
July 05	16.44	13.85	4.13	2.59
				-45.15

As the total abnormal return is much lower than zero, it can be said that the market does not exhibit the semi-strong form of efficiency.

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5. a. From the analysis of the technical charts for the Lead bank Ltd., the following recommendations can be given:
 - A. At this point Price line is below the moving average and both the price line and moving average has started declining, thus it is an indication to sell.
 - B. At this point both moving average and price line has started rising, thus it is an indication to buy.
 - C. The ROC index is rising while it is below the reference line. So it is an indication of the reversal of the falling trend and hence the signal is to buy.
 - D. As the point is falling on the reference line, the signal is not clear; so it is an indication to hold and not to either buy or sell.
 - E. RSI has touched the lower limit of the RSI chart; this indicates an oversold position and price rise is expected, so it an indication is to buy.
- b. Edward and Magee defined Resistance as 'Selling, actual or potential, sufficient in volume to satisfy all bids and hence stop prices from going higher for a time period'. Support is defined as 'Buying, actual or potential, sufficient in volume to halt a downtrend in prices for an appreciable period'.
A support zone is formed when the demand supply balance tilts in favor of buyers, resulting in a concentration of demand. A resistance zone similarly represents a concentration of supply.

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

- i. Support and resistance lines are only approximates of the levels, prices may be expected to 'obey'. They should, therefore, be drawn using judgement, and clues from the past price behavior.
- ii. Penetration of a support or resistance line, also confirmed by an underlying price pattern, is a fairly sure indication of a strong ensuing move in the same direction. New highs are reached

- after resistance line is penetrated and new low follow penetration of a support line.
- iii. Prices are said to remain in a 'congestion zone' as long as they fluctuate in narrow ranges within a support and resistance level. The direction of breakout from a congestion zone cannot be predicted in advance.
- iv. The higher the volume accompanying the confirmation of a support or resistance level, the more its significance.
- v. The speed and extent of the previous move determines the significance of a support or resistance level. Prices penetrate support (resistance) level generally after slowing down from a previous low (high) and hovering around a level for sometime.
- vi. Support and resistance levels repeat their effectiveness time and again, even if separated by many years.

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Section E: Caselets

Caselet 1

6. The following are important principles to be borne in mind, while analyzing price patterns:
- i. The significance of a pattern is a direct function of its size and depth. The longer a pattern takes to complete, and greater the price fluctuations within the pattern, the more substantial the ensuing move is likely to be.
The fluctuations that occur indicate the combat between buyers and sellers. The longer it takes for prices to break through a pattern, the greater is the significance of the penetration.
 - ii. The longer it takes for prices to move out of the pattern, the stronger is, the base of the new trend.
This is due to the presence of both uninformed investors and professionals in the market.
When the prices hit a new low, uninformed investors panic, and start selling. Professionals would, however, accumulate stocks in anticipation of improved conditions in the future. The stocks, therefore, move from weak to strong hands. The reverse process occurs at the market tops. The professionals, who accumulated stocks at the bottom, sell to uninformed investors who are attracted by the rising prices, and buy these stocks.
Thus at market bottoms, the base from which prices rise is strong, as most of the stocks have moved into the hands of professionals. At market tops, the reverse is true as most stock is in the hands of less sophisticated investors, and triggers a sharp fall in prices.
 - iii. Price patterns offer certain forecasting possibilities, because the duration of a trend can be measured, with a certain level of accuracy, on the price charts.
 - iv. A valid breakout can be confirmed, in most cases, if a price change equal to or more than 3% marks the penetration of the boundaries of a pattern.
 - v. The validity of a breakout should be confirmed by volume statistics. Volume advances with rising prices and declines with falling prices. A divergence from this relationship throws up important signals.

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7. There is a phrase "Appearances can sometimes be very deceptive". Thus there are some major pitfalls in charting and its interpretation. They are as under:

One of the limitations in charting is with display technology. Here the screen is made up of thousands of dots known as pixels. These dots are selectively lit up to form characters and other impressions on the screen for the user. While the number of dots varies with the kind of monitor used, we shall discuss the situation where the screen has 640 x 480 dots (that is, there are 640 columns and 480 rows of dots). Assuming that about 20% of these dots are used up in drawing and naming the axes and in naming the chart, etc., we would have roughly a space of 400 x 380 dots for actual plotting. That is, the chart can plot 400 distinct periods and 380 distinct prices at one time on the screen. This physical dimension can pose difficulties in several situations.

Another limitation of charting is related to optical illusion that is often created by the method of drawing the graphs. We would notice that the pattern we visualize when it is spread across larger number of columns is different from the pattern we visualize when it is spread across lesser number of columns. This is optical illusion. Let us say we plot Tisco share price data from January 1 to June 30, 2005, which has 100 observations. Since the space available on the screen is for 400 observations, a point in every fourth

column would be lit up and a line would be drawn through these points to give us a line chart. Now if we expand the observation, say 200 observations. A point in every second column would lit up and joined with a line to produce a chart. These observations can be increased further, say to 400. This would lit up one point in every column. This will have a great impact on the charts, because from being spread across 400 columns, it has got compressed to 100 columns. Thus we have to wary of this, all the time when we are interpreting charts.

To sum up, charting may appear simple and yet is full of details which when ignored would lead to erroneous conclusions. Therefore, before we firm up our interpretation of chart, it is advisable to plot it in several ways, from different time periods, and examine it from all angels, before drawing inferences.

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Caselet 2

8. The sensitivity of the price of the callable bond to the change in the interest rate depends on the changes in the components of the callable bond to the changes in the interest rates. The price volatility of a non-callable bond to the changes in the interest rates depends on its duration. If interest rate rise, the price of the non-callable bond will fall and the price of the call option also will fall. The decline in the price of the call option is because it becomes less valuable as interest rate rise. The decline in the call price will reduce the price of the callable bond too but the impact of the interest rate rise on the price of the non-callable bond will be greater than that on a callable bond. When the interest rates fall, both the price of the non-callable bond and the price of the call option increase. This will cause the price of a callable bond also to increase but to a lesser extent.

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9. Option Adjusted Duration is the modified duration of a bond after adjusting for any embedded optionality. The Option Adjusted measure of duration takes into account the fact that yield changes may change the expected cash flows of the bond because of the presence of an embedded option, such as a call or put. Option-adjusted Duration is defined as follows:

$$\text{Option-adjusted Duration} = \frac{\text{Price}_{NCB}}{\text{Price}_{CB}} \times \text{Dur}_{NCB} (1 - \text{Delta})$$

Where,

Price_{NCB} = Price of a non-callable bond

Price_{CB} = Price of a callable bond

Dur_{NCB} = Duration of the non-callable bond

Delta = Delta of the call option

Note that the delta of a call option measures the sensitivity of the option price to the changes in the price of the underlying asset. The delta value of a call option lies between 0 and 1.

Important factors influencing option-adjusted duration are:

- a) The ratio of the price of the non-callable bond to the price of the callable bond. But these two prices are influenced by the price of the call option. Hence the higher the price of the call option, the higher the value of the ratio. Thus Option-adjusted Duration is indirectly dependent on the price of the call option.
- b) The duration of the corresponding non-callable bond.
- c) The delta of the call option.

The Option-adjusted Duration of a deep discount callable bond is the same as the duration of a non-callable bond. The Option-adjusted Duration of a premium callable bond in which the coupon rate is significantly higher than the current market yield is zero.

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Caselet 3

10. The estimation of capitalization rate for the equity stock of a company must take into consideration the business risk and financial risk (of which default risk is a part) besides the interest rate, purchasing power,

and market risks borne by the shareholders. Business risk arises out of the fluctuations in the earnings of a company – the wider the fluctuations; the greater is the business risk. Financial risk stems from the use of leverage – the use of external debt relative to net worth. Other things being equal, the higher the debt to net worth ratio, the greater is the financial risk.

Estimation of risk premium for an equity stock is a difficult task. One approach can be, to classify the equity stocks of companies into some homogeneous risk classes and estimate the risk premium (the premium for a particular risk class will be the difference between the average rate of return on the stocks in that class and the risk-free rate). For example, the equity stocks can be classified industry-wise and a mean risk premium can be calculated for each class using the time-series data. However, this classification does not take into account the heterogeneity among companies with respect to size, capital structure, etc.

So, a further classification within each industrial class is warranted for fine-tuning the estimation of risk premium on equity stocks. Based on this classification, the capitalization rate for an equity stock can be obtained as the sum total of the risk-free rate and the appropriate risk premium. Alternatively, the capitalization rate for an equity stock can also be determined from the Constant Growth Dividend Capitalization Model. Under this approach, the equity capitalization rate (k_e) will be as follows:

$$K_e = \frac{D_1}{P_0} + g$$

So, the capitalization rate is obtained as the sum total of the dividend yield and long-term growth rate of dividends.

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11. An estimate of 'g' (growth) is usually obtained by determining the compound growth rate of dividends over a long historical period. However, this procedure will not make any sense in the case of companies with a nil or erratic record of dividends. In such case the compound growth rate in earning per share is used as surrogate.

The factors that influence the value of growth are:

- i. Growth rate during extraordinary growth period: The higher the growth rate during supernormal growth period, the greater the value of the growth.
- ii. Length of the extraordinary growth period: The longer the supernormal growth period, the greater the value of growth.
- iii. Probability of projects: The profitability of projects is a determinant of supernormal growth rate and the stable growth rate. When the projects become more profitable, both the growth rates increase, and the resulting value from supernormal growth will be greater.

Riskiness of the stock or equity: Depending on the risk associated with the equity investment, the discount factor to be used is determined. The higher the risk, the higher the discount rate and lower the supernormal growth.

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