
Question Paper

Security Analysis – II : April 2002

Part D : Case Study (50 Points)

- This part consists of questions with serial number 1 - 6.
- Answer all questions.
- Points are indicated against each question.
- Do not spend more than 80 - 90 minutes on Part D.

Case Study

Read the case carefully and answer the following questions:

1. Perform Industry life cycle analysis on Indian software industry.
(5 points)
2. Perform the five factor ROE Analysis for Infosys Technologies and interpret the results.
(8 points)
3. Perform Michael Porter Analysis for the Indian software industry.
(11 points)
4. Perform SWOT Analysis for Infosys Technologies.
(8 points)
5. Perform the fund flow analysis on cash basis of Infosys Technologies for the fy '00 – 01.
(8 points)
6. Calculate the intrinsic value of the equity of Infosys as on 1.04.2001 as per the formula given below:

$$P_0 = 0.15 \times P_{DDM} + 0.85 \times P_{Regression}$$

$$P_{Regression} = 800 + 20.36 \times DP + 17.79 \times GR - 0.41 \beta + 43.81 ROE$$

Where,

DP = Average dividend Payout Ratio, %

GR = Average growth rate in earnings, %

ROE = Average Return on Equity, %

β = Beta of Infosys stock (relevant data appears in **Annexure I** to the case.)

P_{DDM} = Price as per the DDM. Assume the growth rate to be 50% for the next 5 years and 20% thereafter.

(10 points)

The above case is prepared only for the purpose of examination and not to illustrate either effective or ineffective performance of the company. The case contains real information adapted and combined with other information to generate discussion or analysis on the desired topics.

Introduction

The software industry is the fastest growing segment within the Indian IT industry and is earning India very valuable foreign exchange.

The domestic market accounted for Rs72bn while exports accounted for Rs171.5bn in the current fiscal. While domestic software has grown by 45% (46% annualized during the last 5 years). Exports have grown by 57% during the year (62% annualized over the last five years).

The export segment has been the star performer driven by increased prominence of India in the world as quality

supplier of software services. India currently exports software to some 95 countries around the globe and 185 of the Fortune 500 companies have outsourced some part of their software requirement to India. In fact, software exports have become a major foreign exchange earner for the country and account for a substantial 10.5% of India's total exports.

The software export market is essentially a services market. Professional services, which is basically related to sending software professional to work for bits and pieces of large projects, made up a substantial 44% of the total exports. Projects, where the Indian company takes responsibility for completing full projects, made up around 37% of the exports.

The statistics over 5 years upto Fy 2000 is as under

Rs. bn.	1996	1997	1998	1999	2000
Domestic software	16.7	24.1	35.1	49.5	72
Software exports	25.2	39	65.3	109.4	171.5
Total	41.9	63.1	100.4	158.9	243.5

(Source: NASSCOM)

On the economic front the Fy 00-01 began with bad news of the slowdown in US economy, this slow down had world wide repercussions. The events of 11th September, 2001 and their aftermath only amplified economic deceleration and many economies including the US are still formally in recession.

Amidst all this bad news, it is indeed creditable that IT software and services industry in India has continued its robust growth and experienced a 33% increase in exports in the first half of Fy 01-02. It is estimated that the industry has registered an overall year-on-year increase of about 30% for the full year (2001-2002)

Outsourcing of software services from India

The global IT services market was worth around US\$365bn in 1999. Currently, outsourcing and cross-country exports is estimated to be around 6% of this figure, but it is expected that this figure can go up to 25% within the next decade. This throws up immense opportunities for India's software exporters.

The factors, which have contributed towards the growth in outsourcing, market:

- Need to be cost competitive to be able to service global operations
- Increased use of IT as a productivity tool and business growth driver rather than for automation of processes
- Explosion in telecommunication capabilities has rendered location of software development centers immaterial.
- Evolvment of hardware and software technology to open systems
- Increased adherence to quality standards and efficiency parameters in developing countries
- Rapid spread of Internet, electronic commerce, e-mail, networking etc
- The tendency of US companies to retain focus on business plans while transferring the coding and software development job offshore
- Need to outsource certain functions which are difficult to manage in-house for lack of expertise or otherwise.

India has already established considerable presence in the US and has earned the reputation of being the first country of choice among US companies. The regions where it needs to make significant headway are Europe and Japan. European region where outsourcing was at a low ebb until the last few years, is forecast to record the maximum growth in the coming years. Software exports to other countries is also expected to increase, as new markets are vigorously being explored in Korea, South Africa, Latin America and some countries in Asia Pacific.

Domestic Software Industry

Software industry in India though started in seventies but really took off in early nineties primarily due to growth of internet and Y2K bug.

Domestic market for software has recorded a CAGR of 46% over the last 5 years to touch Rs72bn in FY2000. This does not include in-house development efforts undertaken by companies. In the past domestic software market growth lagged behind exports, owing to low penetration of computers and rampant piracy.

- Some of the factors, which have contributed to strong domestic growth in the recent years, include:
- Strict enforcement of anti-piracy laws, bringing down illegal copying of software considerably
- Zero import duty on software
- Growing computerization of business operations, forced by unshackling the economy and freeing several industries from a regulated regime
- Deeper penetration of computers in the household segment
- Increased use of computers as an educational tool

The domestic software market is dominated by products and packages, which account for around 40% of the market and by projects, which accounted for around 30%.

The presence of domestic companies in the software product market is negligible - estimated to be less than 20% in value terms. A NASSCOM study revealed that 280 software packages were released in FY2000 of which 54% were launched by Indian companies. This suggests that Indian companies are getting their act together to fight for market share, particularly in niche segments. A major part of the software products market is estimated to be held by US companies. Strong growth rates were witnessed in FY2000 in the e-commerce segment (200%), banking software (70%), CAD/CAM packages (41%), ERP packages (23%). Most of the demand for software comes from the business segment. Consumer and entertainment software is still a nascent market in India, but has the potential to grow rapidly in the future. Software piracy rates in India are quite high, at about 59%. With swift crackdown on piracy, this should come down in the future – this should spur growth in software packages.

In turnkey projects, Indian companies have a much larger share of the cake. Till recently global companies found the Indian market too small to make a competitive entry. Since the last couple of years several global companies like Microsoft, SAP, IBM etc have set up Indian affiliates/ joint venture companies. These companies besides pedaling parent company's software products also provide specialized software services to domestic companies.

Structure of the Industry

Indian software industry has a mix of a few large companies and several small to medium sized companies. Currently 37 Indian companies have exports of more than Rs1bn. These few large companies would however be classified as small companies by US standards. Most of these large companies are operated by first generation entrepreneurs, who had limited access to finance and low risk taking capability. Smaller companies, which are also typically entrepreneur run companies, have a similar potential to strike it rich.

Geographical distribution

Most of the software companies are concentrated in the western and southern parts of India. These are further concentrated in a few cities. Choice of location has been driven by availability of infrastructure facilities, cost of space and manpower availability. In terms of business size, Mumbai, Hyderabad, Bangalore and Chennai have the highest concentration.

Competitive Position

The Indian software sector has several competitive advantages, which is allowing it to grow at a fast pace. Some of the key advantages are :

1. Locational advantage

India enjoys a locational advantage. The advantage it enjoys over other countries, is a 12-hour difference with the world's largest market - the USA. This enables US companies to establish round the clock software factories by subcontracting to Indian companies.

2. *Manpower*

There is a tremendous latent potential of manpower supply in India. India has the second largest pool of technically qualified English speaking manpower (second only to the United States) available at a comparatively lower cost. Demand for manpower continues to surge. India has the capacity to supply about 70,000 software professionals each year, which hardly meets the global demand. Indian software industry can therefore continue to have a manpower led growth.

3. *Low cost*

Much of India's strong growth in software in the past is attributable to the low cost of Indian programmers. Indian programmers are paid only about 15-20% of his/ her counterpart in developed nations. Even among competing countries Indian software professionals were paid the least. This provided domestic software companies a cutting edge in pricing for software projects. However the low cost edge has now been considerably eroded with most software professionals getting remuneration at par with global standards. Nevertheless in terms of cost-quality, India continues to offer significant 'value for money'.

4. *Wide gamut of services*

India's advantage was that it could offer a wide range of software services from clerical support/ data processing to sophisticated software systems. The low cost and easy availability of manpower at all levels enabled it to offer labor intensive support services, while the technically qualified and skilled personnel enabled it to offer quality solutions involving sophisticated software systems.

5. *Project management skills*

Indian companies have a rich experience of working with large global software companies. The forced subcontracting of large Y2K projects has also provided Indian companies with substantial experience in handling and executing large sized projects.

6. *High on learning curve*

Indian companies have over the last decade built expertise on a variety of platforms - from legacy systems to the latest state-of-the-art systems.

7. *Infrastructure facilities*

India has more than 1200 high-speed communication links of 32-256 KBPS, connecting Indian software companies with their clients abroad. A majority of this infrastructure and communication links are provided by Software Technology Parks of India (STPI).

8. *Conducive regulatory framework*

Software industry has enjoyed virtually unbridled liberty to conduct its business in the best possible manner. Government has also encouraged the industry by providing tax benefits to exporters.

9. *Quality Aspects*

Software companies in India improved their quality tremendously in the last few years. Today they are known for the quality of their software services. India has one of the largest number of quality certified software companies in the world. The increasing quality perception will help India transcend the cost barrier and increase margins in offshore business.

10. *Government Initiatives*

Government has provided several policies to help and improve prospects for domestic software companies. These include Setting up of STPs: STPs (Software Technology Parks) are autonomous organizations setup by the Department of Electronics (DOE). Under the STP scheme, member software units are provided various incentives. Currently the Government has set up STPs at various cities like Bangalore, Pune, Bhubaneswar, Thiruvananthapuram, Hyderabad, Noida, Gandhinagar, etc.

To provide further incentives to units in the STP, government relaxed the 100% export requirement. Software companies are also exempted from applicability of Minimum Alternate Tax (MAT).

Export processing zones (EPZ): The government has set up various EPZs. Units setup inside the zone can have 100% foreign equity. The firms are expected to export 75% of their production and can sell the balance in the domestic market. Additional incentives are provided in the form of cash compensatory support, a tax break for 5 years and exemption from income tax on export profits.

Telecom policy: In May 1994, the government released the Telecom Policy to improve the telecommunication infrastructure in India. The policy sought to encourage privatization of infrastructure, which was a radical step at that time.

Curbing piracy: To protect the intellectual property rights (IPR) of software companies, apart from cracking down on piracy, the government has also made several policies to actively discourage piracy. Authorized sellers of imported software are allowed to reproduce software in India and sell it without import duty. Local software manufacturers are exempt from excise taxes.

11. *Other incentives include:*

- Depreciation on IT products allowed at 60% pa, taking into cognizance the high rate of obsolescence of such products.
- Exemption of withholding tax on interest on ECBs is proposed to be extended to the IT sector as well. This will reduce cost of borrowings for IT companies through the ECB route.
- 100% customs duty exemption on all software used in the IT sector.
- Extension of 80HHE to the supporting developers. This will enable supporting developers to enjoy tax concessions, similar to the supporting manufacturers concept in manufacturing sector.

The new Information Technology Bill

The much-awaited Information Technology (IT) Bill was passed by the Lok Sabha in the month of May 2000. Even though there has been some criticism about the provisions of the bill, the fact that the e-commerce transactions/ cyber-crimes are still very nascent areas in the Indian context means that it would have been quite impossible for any Bill to have been fully comprehensive. As the market matures and the users get a hang of the existing regulations, new amendments can be brought about as and when required. Trying to make the first Bill comprehensive would have only delayed the implementation.

It would be useful to have a look at the major provisions within the bill and their impact:

- Should boost e-commerce

The Bill is expected to give a major thrust to e-commerce activities in the country. Though e-commerce activities have started off with most e-commerce sites offering payment through credit cards (where the user keys in his credit card number), there were many apprehensions regarding this given the absence of clear-cut laws and the lack of legal recourse available to any consumer. With the new set of laws, it is expected that buyers on the net would have the required confidence to transact without fear.

- Digital signatures would come into play

A good part of the new act is the fact that it recognizes digital signatures. The creation of digital signatures, their certification and verification is an absolutely new area which opens up large areas for software companies with an expertise in the areas of encryption.

- Need to keep electronic records

The requirements of maintaining electronic records would mean that all companies would have to progressively move to standardised data storage in electronic form. Though most companies do maintain electronic records, it would now require verification of security procedures for storing such records. In this aspect, the penalty for "tampering with computer source documents" which stands at Rs.0.2mn seems quite low.

- What about taxing transactions on the net?

Taxation issues relating to e-commerce transactions have not been considered within the Bill. This is a big grey area, which is creating a debate even in the United States. While supporters of zero-tax on the net say that this is essential to boost e-commerce traffic, those supporting taxation say that this could have an adverse effect on the revenues of state governments.

- Worrying thoughts on policing of crime

Eyebrows are being raised by most people on the provision allowing police officers above DSP rank to raid and arrest people for cyber-crimes without a warrant (under clause 79). Giving the notoriety of the police force regarding their tendency to misuse their powers, it is being said that this will just open another avenue to the police force to earn money and will only lead to more corruption.

Risk Factors

- Manpower availability and cost

India has more than 1,900 institutions from which about 70,000 software professionals graduate each year. This is further supplemented by private training centers which coach about 40-45,000 students each year. With many students opting for further studies/ other employment streams and several overlap between students at institutions and training centers, it is estimated that India can supply about 75,000 software professionals each year. Despite this huge addition to the manpower base each year, the demand-supply situation is expected to remain tight during the next 3 years.

Salary levels for experienced and qualified professionals are broadly at par with developed countries. The rising cost of manpower has already eroded India's position as a cheap source of labor to a large extent. This increases the risk of losing business to competing countries like China and Russia who have cheaper labor, if they would be able to match the quality Indian professionals offer.

Moreover, to maintain profitability on the increased cost, software companies will have to increase productivity i.e. maximize revenue/profits per employee. Till the time Indian software companies are able to move up the value chain to products and transcend the cost barrier, they carry a risk of low profitability.

- Manpower turnover

It is essential that an organization keeps employee turnover to a minimum, so as to maximize on productivity. This is even more important if an employee has to undergo initial training to develop specific skills. Employee turnover occurs as employees show little respect for continuity with a single organization and even employers actively 'poach' from competing companies by offering more lucrative salaries. Most software companies have been providing various incentives and stock option schemes to retain talent, especially at senior levels. Organizations also have to provide better working facilities to motivate employees to put in their best.

- Skill and experience levels

Indian programmers have a wide range of skills, with experience on legacy systems and on latest platforms as well. They have also displayed an ability to learn and adapt quickly to the changing environment. However, about 77% of the software professionals in India have a work experience of less of 7 years. Corporate therefore need to continuously invest in training to improve skill levels further, especially in the area of functional domains.

- Availability of infrastructure

The current boom in the software sector can be sustained through an increase in off-shore programming activity. This places special emphasis on availability of quality infrastructure facilities in the form of hardware/software, power and telecom links. India's power and telecom infrastructure is poor compared to many developing countries. On top of that power and telecom costs are among the highest in the world. One of the prime reasons for this has been the state monopoly over these sectors. The attempts at privatizing these institutions have not improved the situation in a significant manner. For software companies, investing in telecom infrastructure is an additional overhead, which few companies will be able to afford.

- Poor government demand

In most developed countries government/public sector enterprises constitute the largest consumers of IT. In India public sector companies are generally reluctant to introduce IT in a major way, as this would antagonize the trade unions. Public sector companies' policies also tend to be pro-labor. The software sector therefore receives negligible encouragement from the public sector unlike most of the leading IT countries in the world.

- Government policies

Government policies so far have been favorable to software companies. If tax exemption on exports is withdrawn it could affect software companies adversely. WTO regards tax exemptions on exports as an indirect subsidy and hence the government may phase out exemption in the near future. Also government policies in future should be framed to encourage development of application software packages, as this can only sustain the current growth rates.

- **Non-tariff trade barriers**

Several non-tariff trade barriers exist in foreign countries, which could restrict growth of Indian exports. For example, since October 92 only H-1B visas are issued irrespective of the duration of the project. Earlier for short term project B-1 visas were issued, which were easier and faster to obtain. H-1B visas require several clearances and take about six weeks to process. It also requires retention of legal counsel to follow up with the respective offices.

Also the US has permitted to allow only 115,000 visas worldwide for skilled IT professionals. This typically gets exhausted in the first 7-8 months of the year.

Indian software professionals working in US are also subject to social security taxes (FICA 12.4%, MEDICARE 2.9% and FUTA 6.2%) even if they are deputed on short-term assignments. The benefits from these contributions can be drawn only after a specified term of employment. Therefore this therefore amounts to an extra tax of about 21%, which Indian software companies have to forego.

Several such subtle trade barriers can restrict Indian companies' ability to maintain the current pace of growth.

- **Financing**

Software companies require finance for setting up development centers, establishing communication links and other infrastructure and for working capital. Traditionally, lenders have been averse to project finance due to lack of tangible assets as security. The recent spurt in share prices of all the listed software companies reflects the confidence amongst investors. This should enable software companies to raise adequate finance in the form of equity. But government has to set machinery in place to provide software companies with venture capital, project and lease finance etc.

- **Quality**

India has gradually moved into high quality but competitive cost bracket. Currently, many of the large companies hold quality certificates. However, there are various quality levels and standards. Moreover Indian companies need to pay more attention to Total Quality Management and not just Production process quality.

- **IPR**

Indian companies have to move up the value chain to become truly global companies. This requires a strong policy on IPR and strict enforcement procedures. Uniformity of IPR policies with the 'target countries' will also help Indian companies to improve export prospects.

Infosys Technologies Ltd

Infosys is India's top-ranked software company. It is the undisputed leader in the industry in terms of the quality of its people, its technological prowess, the quality of most of its projects and its client list. The company has a high quality of management that, apart from giving the company the right strategic direction, has set high standards of corporate governance along with transparency of operations.

Infosys offers its clients services in the area of software development, maintenance and reengineering services and e-commerce and internet / intranet consulting. The company also operates dedicated offshore development centres for some of its clients. The company offers clients both onsite and offshore services. In the domestic market it operates in the domain of banking where it has three products Bancs 2000, BankAway and FINACLE (launched in FY01). This makes a very small part of its revenues with the bulk of its revenues coming from export revenues.

ITL has moved up the value chain by offering more productized services, such as In2000 (for Y2K), IntERPryzfor ERP and In-Euro for the Euro opportunity and banking services. Infosys does all its projects in full project management basis rather than subcontracting larger projects or supplying manpower. This has proved to be a valuable experience that has helped the company developing the required project management capabilities. Handling full life cycle projects not only gives the company higher margins but also helps it to build strong relationships with clients as they interact with the clients directly.

Infosys has adopted high quality standards for its software development process and is one of the few companies in the world to get the SEI Level 5 Certification along with other quality certifications like ISP and TickIT. The company also has a very high quality of employees due to its strong personnel policies. This is a significant competitive advantage in an industry where the key resource is manpower.

The company had a very successful offering of American Depository Shares in March '99 wherein it raised around \$70mn. This money has been raised for development efforts as well as to have a foreign currency for acquisitions. The company has been on the lookout for suitable targets for acquisitions but hasn't done any yet.

Infosys was started in 1981, as a private limited company, under the name of Infosys Consultants Pvt. Ltd. A team of seven experienced software professionals, led by Mr.N. R. Narayana Murthy promoted the company. They brought into the company their wide experience, having handled projects in developed countries like USA, Europe and Canada. The company's operations were carried out from a development centre in Bangalore. Growth came in the early 90s', thanks to large offshore contracts from two major US companies - Reebok and GE. In 1992, the company was converted into a public limited company and rechristened, as Infosys Technologies Ltd. Growth has been export led, with exports constituting a major part of the revenues. In 1993, the company had its IPO of 1.37m shares at a premium of Rs85. The funds were used to set up a new software development facility, at the outskirts of Bangalore city. In 1994, the company made a private placement of 5,50,000 shares at Rs450 each to FIIs, Financial Institutions and corporates. In March 1999, Infosys issued 2.07mn American Depository Shares (equivalent to 1.035mn equity shares of Rs.10 par value each) at US\$34 per ADS under the ADS program and the same got listed on the NASDAQ.

Business

Infosys offers its clients a mix of both onsite and offshore services, according to the requirements of the client. On-site services made up 52% of the company's revenues in the financial year 2001; the rest being contributed to by offshore services. The company bills its clients on a fixed-price basis where it is reasonably sure of the scope and the expected time frame of the project and for other cases it bills its clients on a time-material basis. This would, obviously, also depend on the requirements of the client.

The key domains where Infosys offers its services are:

Domains	% of revenue in FY01	% of revenue in FY00
Manufacturing	17.8	23
Insurance, banking and financial services	33.7	30.1
Telecom	18.4	15.4
Retail	9.1	10.6
Others	21	20.9

The company had managed to make a significant entry into services related to internet/intranet and e-commerce with revenues of 117.5mn US\$ coming from this segment in FY01. However, the company is now trying to pare its exposure to this segment- particularly, the dot-coms and venture funded companies given the uncertainty. It plans to focus on Fortune 500 and other established corporations.

In the domestic market the company operates in the vertical of banking through its Banking Business Unit (BBU). The unit grew its revenues by 100% in FY 01, but contributes only 2.6% of total turnover. The company launched FINACLE during the year, an integrated core banking solution that is centralized, multi currency and multi language. FINACLE has been a success for the company with 5 private sector banks in India already using this package. Punjab National Bank has entered in to a contract with the company to deploy FINACLE at 1500 branches across India.

Infosys Technologies Ltd. had total of 273 active clients in the end of FY 2001 and in the year alone it added 122 clients to its list. The new clients added to the already impressive list of clients like GE, AT&T, Bell Northern, Xerox, Levi Strauss, Reebok, Toshiba, Capital One etc. include some of other global majors like ABB Alstom, New York Life International, The Bank of Nova Scotia, Schulmberger, Vodafone etc. Repeat business made up 85% of Infosys's revenues for FY2001. The top 5 clients made up 26% of its total revenues in the current year (30.2% last year), while the top 10 clients made up 39.2% of the revenues (45.7% last year).

Though there has been a slow down in the US economy affecting the growth of most of the software companies, Infosys Technologies Ltd. has forecasted a growth of about 30% for the year 2002 mainly because of uncertain conditions prevalent in the market. The company added 4442 employees during the year, net of separations, taking the total employee strength to 9831. Infosys also added 640,000 square feet of physical space taking the total space available to 1.67 mn sq ft. The total number of marketing offices increased to 25, up from 20 in the previous year.

Infosys Technologies Ltd
Profit & loss account (Rs. mn)

Period ended	Mar, 1998	Mar, 1999	Mar, 2000	Mar, 2001
No. of months	12	12	12	12
Gross Sales	2,576.40	5,088.90	8,823.20	19,005.70
Net sales	2,576.40	5,088.90	8,823.20	19,005.70
Other income	27.2	38.5	391.4	593.7
Total income	2,603.70	5,127.40	9,214.60	19,599.40
Communication expenses	n/a	95.9	173.1	315.3
Conveyance, travelling and living expenses	n/a	622.7	917.7	1,656.30
Education, training and software related expenses	474.8	277.6	303.1	616.5
Cost of material	474.8	996.1	1,393.90	2,588.00
Employee cost	937.3	1,660.60	3,345.60	7,177.80
Power & fuel	16.7	27.3	50.1	117.8
Advertising/ promotion/ public	12.6	27.7	59.8	130.7
Freight & forwarding	n/a	0	2.4	5.6
Other expenses	276.2	498.2	574	1,490.20
Cost of sales	1,717.50	3,209.90	5,425.80	11,510.10
PBIDT	886.1	1,917.50	3,788.80	8,089.20
PBDT	886.1	1,917.50	3,788.80	8,089.20
Depreciation	227.5	358.9	532.3	1,128.90
PBT	658.6	1,558.60	3,256.50	6,960.30
Provision for taxation	40	186.2	394.6	713.1
Extraordinary items/ Prior year adj.	-15.1	-19.7	73.3	40.9
Adjusted PAT	603.6	1,352.60	2,935.20	6,288.10
Dividend payout	77.3	133.2	330.4	748.6
Forex inflow	2,260.40	4,774.40	8,517.20	17,282.30
Forex outflow	986.5	1,925.60	3,365.80	7,275.30
Contingent liabilities	129.3	302.7	859	2,582.90

Infosys Technologies Ltd
Latest Quarterly Results - 12/2001 (3 months) (Rs mn)

Period ended	Dec, 2001	Dec, 2000
No. of months	-3	-3
Sales	6,608.10	5,370.70
Other income	149.3	144.7
Total income	6,757.40	5,515.40
Expenditure	-3,933.60	-3,326.90
Operating profit	2,823.80	2,188.50
Interest	0	0
Depreciation	-413.4	-330.2
Profit before tax	2,410.40	1,858.30
Tax	-350	-195
Profit after tax	2,060.40	1,663.30
Adjusted profit after tax	2,060.40	1,663.30

Infosys Technologies Ltd

Balance sheet (Rs. mn)

Period ended	Mar, 1998	Mar, 1999	Mar, 2000	Mar, 2001
No. of months	12	12	12	12
SOURCES OF FUNDS				
Equity capital	160.2	330.7	330.8	330.8
Capital reserve	35.9	59.4	59.4	59.4
Share premium account	415	3,199.90	3,183.70	3,207.50
Profit & Loss/ General reserve	1,118.50	2,154.30	4,759.10	10,298.70
Reserves and surplus	1,569.40	5,413.60	8,002.30	13,565.60
Net worth	1,729.60	5,744.30	8,333.00	13,896.40
Total debt	-	-	-	-
Capital employed	1,729.60	5,744.30	8,333.00	13,896.40
APPLICATION OF FUNDS				
Gross block	1,051.40	1,689.20	2,840.30	6,311.40
Accumulated depreciation	-475.1	-830.9	-1,336.50	-2,441.30
Capital work in progress	73.2	148.8	569.6	1,706.50
Total fixed assets	649.5	1,007.20	2,073.30	5,576.60
Investments	107.8	7.5	138.4	341.2
Sundry debtors	398.8	845.2	1,361.80	3,023.70
Cash & bank balance	438.7	4,050.50	4,317.90	3,850.60
Total loans & advances	391.8	683.6	2,101.30	4,302.80
Sundry creditors/ Acceptances	-103.4	-134.5	-267	-575.5
Other liabilities	-8.7	-293.8	-404.5	-773.7
Provisions	-145	-421.3	-988.2	-1,849.30
Net current assets	972.3	4,729.60	6,121.30	7,978.60
Capital deployed	1,729.60	5,744.30	8,333.00	13,896.40

Annexure - I

Particulars	Return (%) *	Variance	Correlation matrix	
			Infosys	Market
Infosys	109.15	625.00	1.00	0.70
Market	20.00	225.00	0.70	1.00

* The returns are geometric returns since the year 1997 till date for Infosys as well as the market.

END OF PART D

Part E : Caselets (50 Points)

- This part consists of questions with serial number 7 - 13.
- Answer **all** questions.
- Points are indicated against each question.
- Do not spend more than 80 - 90 minutes on Part E.

Caselet 1

Read the following caselet carefully and answer the following questions:

7. "Irreversible changes are taking place in the supply side factors that determine inflation". What are these supply side factors? Elucidate.

(6 points)

8. Depressed conditions, especially on the personal income front, may not allow you to benefit from the low inflation. There are some adjustments you might have to make in your money management strategies, especially in the short run. What are these strategies? Elucidate.

(8 points)

If you're looking for an early morning pick-me-up, look no further than your steaming cup of coffee. The newspapers certainly can't be expected to bring you much by way of joy. Or can they? Headlines in recent times have been rejoicing inflation's reduction to a 20-year low. So, is this really the first piece of good news to brighten the otherwise unmitigated gloom?

We hate to say this, but there's probably little reason to rejoice. Yes, in theory, low inflation rates are just what the doctor ordered. The low rate basically means a slowdown in the price rise, which in turn means a slower erosion of purchasing power. And the graph has been sliding since August 2001, when inflation rose by 5.3 per cent compared to 5.4 per cent the previous month. The second week of January saw the wholesale price index (WPI-based on wholesale prices of goods) inflation rate at 1.6 per cent. Theoretically, this should be great news for growing your wealth.

On ground, however, analysts see no joy. "There isn't much to rejoice," says Shekhar Sathe, managing director, Kotak Mahindra Finance. And most economists, fund managers and personal finance experts share his view. Here's a look at just why they are playing Doubting Thomas. But we also go on to see how best you can manage your finances and savings in this regime.

Most experts argue that the major cause of the present low inflation rates is falling demand in the economy. "There isn't enough income generation and employment creation," says M.R. Madhavan, an economist with the Bank of America, Mumbai. This has forced producers to make adjustments accordingly. "Manufacturers and retailers are selling products at discounts to clear off inventories," says Delhi-based Gurinder Singh of Parasmoney, a personal finance advisory firm.

Manufacturers are responding by reducing output. "The manufacturing sector is utilising only 75 per cent of its total capacity," says Madhavan. This is one reason why the prices of products from the manufacturing sector—which has a 64 per cent weightage in the index—have declined. At the same time, prices of primary articles (with a 22 per cent weightage in the index), including food items among other things, have stayed stable, thanks to 65 million tonnes of buffer foodgrains stock. Fuel prices, the other important component, with a 14 per cent weightage in the index, have also remained stable.

"The current situation is a mirage. This hasn't happened due to improvement in the messy fiscal situation, most often the cause of inflation," says T.P. Raman, managing director, Sundaram Newton Asset Management Company.

While practically all economists agree that the current situation is an aberration caused by lower pay hikes and job losses, it could be an indication of things to come. While inflation will definitely rise again, mainly due to demand picking up, it won't rise beyond a point. Agrees Madhavan: "I expect the inflation rate to be around 5 per cent in future." If it does stay within this band, it would be a radical change in the country's inflation history. In the 11 years since 1990-91, the average rate has been a steep 8 per cent. With irreversible changes in supply-side economics and greater integration with the global economy, inflation is unlikely to touch the astronomical figures of the past.

"Irreversible changes are taking place in the supply-side factors that determine inflation," says Ashima Goyal, professor, Indira Gandhi Institute of Development Research, Mumbai.

Caselet 2

Read the following caselet carefully and answer the following questions:

9. The market has a long list of exuberances followed by crashes. In the backdrop of this, how far is the calculation of asset values from fundamentals and the concept of efficient market hypothesis relevant?
(6 points)
10. Discuss the different methods of valuing real assets.
(9 points)
11. The asset price bubble is the outcome of irrational exuberance. A bubble is a psychological concept rather than a financial concept. Give your comments.
(5 points)

In July of 1998, the Dow Jones industrial Average (DJIA) hit a then all-time high of 9,337. About eight weeks later, it had fallen to a low of 7,615 before again turning around. By the end of 1998, the DJIA had rebounded to 9,181, a 16 percent year-over-year rise that capped eight consecutive years of gains – a phenomenal record. This stretch of gains is the longest in the DJIA's 103-year history. Moreover, there have been strong gains, averaging about 17 percent a year since 1991.

This run-up in the market has left many investors wondering whether the good times will continue. Some cannot even remember what a bear market is, believing it to be a myth of generations gone by. Indeed, the DJIA has not posted two consecutive years of annual decline since the late 1970s. In the 1980s, the DJIA declined in only 1981 and 1984. Even the stock market crash of 1987 failed to stop the DJIA from ending the year up more than 2 percent, despite losing almost 25 percent of its value in one day. In fact, the last annual decline was in 1990, and that year involved a military build-up in the Persian Gulf region and a recession. From any perspective, the US stock market has shown amazing resilience over time.

The cause of this seemingly unending rise in stock prices is also of keen interest, especially to economists. Although several explanations have been proffered, the underlying controversy basically splits economists into two groups: those who believe the rise is justified by market fundamentals and those who do not. Clearly separating the two groups, though, is easier said than done, as much research has shown. To illustrate the argument, some background is needed.

The term "assets" encompasses a huge array of tangible items of value that provide current and future economic benefits. When discussing assets, ordinary investors usually are referring to equities (stock) and real estate. And often, it's the asset's price that is most discussed. Pricing real estate is probably the more straightforward of the two, as anyone who has ever bought or sold a house knows. The price of the house depends on the value of the land it sits on and the cost of building the structure. The price also depends on market conditions at, or near, the time of sale: real estate agents and appraisers often examine "comps" – recent sales of similar houses in the neighborhood – to help them gauge current market conditions. The same could be said of buying and selling automobiles: People check "book" (resale pricing guides) values and scan newspapers to see what similar vehicles are selling for.

Caselet 3

Read the following caselet carefully and answer the following questions:

12. With modernization of stock market the regional stock exchanges are recording near zero trading. Do these exchanges serve no useful purpose and should be closed down?
(8 points)
13. Discuss the steps these regional stock exchanges should take to survive in the present situation.
(8 points)

With the Bangalore Stock Exchange (BgSE) recording near zero trading in the new year, the very survival of regional stock exchanges is now at stake. The BgSE is not the first regional stock exchange to record negligible trading.

But when the stock exchange representing a city that likes to believe it is in the forefront of the economic reform process does not find trading viable, it is clear that regional stock exchanges are on their deathbed.

How the rest of the economy will react to their passing could well determine the future of Indian capital markets.

It is not that the demise of regional stock exchanges will find many mourners. Reformers have tended to be quite dismissive, even contemptuous, of these exchanges.

They see the death of these exchanges as no more than the natural result of the modernisation of stock markets. With the spread of on-line trading, traders in remote parts of the country can deal directly with the National Stock Exchange or the Bombay Stock Exchange.

Sucheta Dalal, a regular columnist, concurs, "India should ultimately merge even BSE with NSE and should go for only one exchange. This is a natural outcome of demutualization. See the global trend, all the seven exchanges of United Kingdom and Republic of Ireland were merged way back in 1973 to form the International Stock Exchange with London as the hub and floors being established at other centers. We should learn from international experience".

The investors no longer need to go through regional exchanges. The only question for the reformers then is when to remove compulsory listing of companies in their local exchange. Without the fees for listing, many of the regional stock exchanges will lose their life support systems.

With so few mourners it is tempting to believe there is no reason to regret the demise of the regional stock exchanges. And if we see these exchanges as being capable of no more than the limited role they played in recent years, this is probably true.

END OF PART E

END OF QUESTION PAPER

Suggested Answers

Security Analysis – II : April 2002

Part D : Case Study

1. Indian software industry had started in seventies. The growth though good was not still catching national fancy. In nineties spectacular development took place due to explosive growth of internet and the challenges posed by Y2K problem. As a result in closing five years of the last millennium the software in India clocked a CAGR of 46%.

In September, 2000 Nasdaq crashed and so called tech bubble burst. By March, 2001 Indian software sector started feeling the heat as major destination of software export was U.S. only. The events of September 11 and their aftermath reduced the growth rate to about 30%.

The above characterize second stage of Industry life cycle i.e. **expansion stage** as the survivors from the pioneering stage are identifiable. The companies continue to grow and prosper, but the growth rate is more moderate than before. At their expansion stage of life cycle, industries improve their product and perhaps lower their prices.

2.

	1998	1999	2000	2001
PAT	603.6	1352.6	2935.20	6288.10
PBT	658.6	1558.6	3256.5	6960.3
PBDIT	886.1	1917.5	3788.8	8089.2
Net sales	2576.4	5088.9	8823.2	19005.7
TA	1986.7	6593.9	9992.7	17094.9
NW	1729.6	5744.3	8333.0	13896.4
PAT/PBT (1)	0.9165	0.8678	0.9013	0.9034
PBT/PBDIT (2)	0.7432	0.8128	0.8595	0.8604
PBDIT/Sales (3)	0.3439	0.3768	0.4294	0.4256
Sales/TA (4)	1.2968	0.7717	0.8829	1.11
TA/NW (5)	1.1486	1.1479	1.1991	1.2301
ROE(%) = $1 \times 2 \times 3 \times 4 \times 5$	34.899	23.54	35.21	45.17

Following can be inferred from above:

- i. Profit retention after tax had reduced in 1999 and picked up subsequently. This was because there was hefty increase of 366% in the tax incidence in 1999.
- ii. PBT to operating profit ratio has increased over the entire period indicating that financial cost as a proportion has fallen.
- iii. Gross profit margin has increased throughout the period falling marginally in 2001 indicates better management of operations.
- iv. Asset turnover had drastically reduced in 1999 before slowly recovery subsequently. It is because sudden rise in asset by 232% in 1999.
- v. The leverage TA/NW remained almost constant in 1999 and subsequently has risen significantly due to greater use of current liabilities (primarily provisions).
- vi. As a result of above factors ROE has fallen in 1999 before recovery in 2000 and increasing subsequently.

3. Michael Porter analysis of the Indian software Industry

Threat of Entry: High

- It is very high due to low economies of scale
- Capital requirement is very low
- Cheaper skilled man-power, reputation of Indian brain, knowledge of English language and Government subsidies etc. all help the new entrants.
- Software products are of two types – general purpose and tailor made. The general purpose software e.g. Windows, MS-Office, Oracle etc. enjoys product differentiation because of brand identification and past advertisement. The tailor-made software also upto some extent enjoys differentiation due to customer service and customer loyalties.

Intensity of Rivalry among existing players: High

- There are a large number of players in the market.
- Indian as well as US economy is under recession, and hence the growth of Indian software industry has come down to about 30%.
- The companies are improving their products and under competition covering their prices.
- Employee loyalties is less and the industry witnesses a high employee turnover.

Bargaining Power of Buyers: High

- Customers are increasingly demanding more and better services at the same or lesser cost.
- Most of the big companies deal with few buyers which can negotiate to bring down the prices.

Bargaining Power of Suppliers: Moderate

- The suppliers are the hardware suppliers. Due to cut-throat competition they are not in bargaining position.
- Due to high employee turnover the employees which are the main resource do command certain bargaining power. This has however come down significantly in the recent past.

Threat of substitute products: High

Due to fast pace of technological breakthrough the quality and performance of software change very fast. In fact, every 18 months new developments give fillip to newer softwares. The changing customer needs also make the existing software redundant.

4. SWOT analysis of Infosys

Strength

- Undisputed leader in the industry in terms of the quality of its people and its technical prowess
- It has very high quality of management which
 - Provides, the company right strategic direction
 - Has set high standard of corporate governance
- The company offers a wide variety of client services in the area of
 - Software development
 - Software maintenance
 - Reengineering
 - e-commerce
 - Internet/intranet consulting
 - Online and offline services.
- The company has three products namely Bonus 2000, Bank Away and Finacle in the domain of banking.
- It has moved up the value chain by offering more products.
- Handling full life cycle projects has helped the company to build strong relationships with clients. This has also provided higher margins to the company.

Weakness:

- Major source of revenue comes from only one country (U.S.) that too from a few corporates.
- Due to the explosive growth Infosys has experienced it faces the challenge in orienting the new employees to the company vision and strict quality performance requirements.

Opportunities:

- The company may be benefited in opening of domestic insurance sector and telecom sector. In these sectors the company is already having substantial presence albeit in U.S. Market.
- New areas are opening up particularly in Bio technology sector
- European, Japanese and Chinese markets have also shown good demand for software products.

Threats

- The major export destination is experiencing a recessionary period
- Dot.com bubble has burst
- Government may change its policy towards software industry
- China is coming up as a big competitor to Indian companies.
- Piracy of software is rampant. Government has not been able to handle it effectively in past. In future also this may pose a threat.

5. The cash flow Analysis of Infosys for FY '01 is as follows:

Fund from operating activities	
A. Pretax income from operation (6960.3 – 593.7)	6366.60
B. Depreciation	1128.90
C. Other income/Prior period adj (593.7 + 40.9)	634.6
D. Tax	(–) 713.10
E. Cash profits (A + B + C + D)	7417.00
F. (Inc)/Dec in trends working capital	
– Inventories	Nil
– Sundry Debtors	(–) 1661.90
– Sundry Creditors	308.50
– Other liabilities & provisions	1230.30
G. Net adjustment due to working capital	(–) 123.10
H. Operating Activities (E + G)	7293.90
I. (Inc.)/Dec in fixed assets [(2073.3 – 5576.6) – 1128.9]	(–) 4632.20
J. (Inc.)/Dec in investments	(–) 202.80
K. (Inc.) Dec in loans & advances	(–) 2201.50
L. Investing activities (I + J + K)	(–) 7036.50
M. (Inc.)/Dec in equity/premium	23.80
N. Dividends	– 748.60
O. Financing activities (M + N)	(–) 724.80
P. Cash generated (H + L + O)	– 467.40
Q. Opening cash balance	4317.90
R. Closing cash balance	3850.50

6. I. **Price using regression equation**

$$P/Bv = 800 + 0.80 \times \text{Dividend payout} + 7.79 \times \text{Growth of earnings} - 0.41 \text{ beta} + 13.81 \text{ ROE.}$$

$$\begin{aligned} \text{Beta} &= \rho_{i,m} \times \frac{\sigma_i}{\sigma_m} \\ &= 0.7 \times \frac{25}{15} = 1.16. \end{aligned}$$

Dividend Payout Ratio (%)

Year	Dividend Payout Ratio (%)
1998	12.81
1999	9.85
2000	11.25
2001	11.90

$$\begin{aligned} \text{Average Dividend Payout Ratio} &= \frac{12.81 + 9.85 + 11.25 + 11.90}{4} \\ &= 11.45\%. \end{aligned}$$

Growth Rate in Earnings

Year	Earnings Growth %
1998	–
1999	124.08
2000	117.00
2001	114.23

$$\begin{aligned} \text{Average Growth Rate} &= \frac{124.08 + 117.00 + 114.23}{3} \\ &= 118.44\%. \end{aligned}$$

Alternatively,

$$\begin{aligned} g &= \left(\frac{6288.1}{603.6} \right)^{1/3} - 1 \\ &= 2.184 - 1 = 1.184 \text{ i.e. } 118.4\% \end{aligned}$$

ROE (Return on Equity)

Year	ROE (%)
1998	34.89
1999	23.55
2000	35.22
2001	45.25

$$\text{Average ROE} = \frac{34.89 + 23.55 + 35.22 + 45.25}{4}$$

$$= 34.73.$$

$$\begin{aligned} P_{\text{Regression}} &= (800) + (20.36 \times 11.45) + (7.79 \times 118.44) - (0.41 \times 1.16) + (13.81 \times 34.73) \\ &= 800 + 233.12 + 2107.04 - 0.47 + 1521.52 \\ &= 4661.21 \end{aligned}$$

II. Price as per DDM

The face value of Infosys share is Rs.5 (The face value was not given in the question as it is a very popular stock)

$$\text{EPS for the year 2001 is: } \frac{6288.10}{66.15} = 95.06.$$

It is given that the earnings will grow by 50% for the next 5 years and 20% later. Further, it is assumed that

- i. The dividend payout ratio is the same as in 2001 – 2002.
- ii. The risk free return of 8.5% in line with the prevailing interest rates.

The required rate of return

$$\begin{aligned} R_e &= R_f + (R_m - R_f) \beta_i \\ &= 8.50 + (20 - 8.50) 1.16 \\ &= 8.50 + 13.32 = 21.84\%. \end{aligned}$$

Year	DPS	PVIF@ 21.84%	PV (DPS)
2002	11.32	0.8208	9.29
2003	16.98	0.6737	11.44
2004	25.47	0.5530	14.08
2005	38.20	0.4539	17.33
2006	57.31	0.3726	21.35
			73.49

$$\begin{aligned} P_5 &= \frac{57.31(1.2)}{0.2184 - 0.2} = \frac{68.77}{0.0184} \\ &= 3737.5 \end{aligned}$$

$$\begin{aligned} \text{Value at the end of year 5} &= 3737.5 \times \text{PVIF} (21.84\%, 5) \\ &= 3737.5 \times 0.3726 = 1392.59 \end{aligned}$$

$$\begin{aligned} \text{Price as per DDM as on 1.4.2001} &= 73.49 + 1392.59 \\ &= 1466.08 \end{aligned}$$

$$\begin{aligned} P_0 \text{ as on 1.4.2001} &= 0.15 \times 1466.08 + 0.85 \times 4661.21 \\ &= 4181.95. \end{aligned}$$

Part E: Caselets

Caselet 1

7.
 - a. **Increasing competition:** A more open economy has raised the level of competition, especially from international players. This is forcing companies to become more cost efficient. Besides internal cost restructuring, cheaper imported inputs are helping companies cut costs. Thus, in turn, forces prices down.
 - b. **Free prices:** As the external price administering mechanism is dismantled and market forces are allowed free play, artificially high prices are slowly replaced by lower, market – determined prices.
 - c. **Institutional changes:** RBI now has greater autonomy in money management and interest rate mechanism. Such institutional changes are forcing down inflation.
8.
 - a. **Investment in Equity:** The basic parameters of investment remain unchanged, worldwide research shows that equities are the best bet to overcome inflation in the long run. This holds true for deflation as well, low inflation periods are marked by falling equity prices. Despite the destruction of wealth, as

- is happening now in the stock market, buying opportunities around, if one has the risk then exploit it.
- b. **Investment in Debt:** Falling inflation is often accompanied by falling interest rates. This is happening in economies from the US to India, impacting returns from fixed-income investments.
Declining interest rates will force to manage debt investments activity. In the declining interest rate scenario capital gains can be harnessed by shifting the debt of lower to higher duration. Further, one will need to spread monies in several baskets and with varying degrees of liquidity.
 - c. **The income ladder:** Create an income ladder. Invest in investments of different maturities, so that some returns can be reinvested in higher paying options as and when rates go up. One must invest in such a way that the investments mature at regular intervals to meet liquidity needs.
 - d. **Investment in Real Estate:** Normally the price of real estate will be falling in such environment. Buying a house in such scenario is a good proposition.

Caselet 2

9. Calculating asset values from market fundamentals is a method that's well-grounded in economic theory. The theory relies on two assumptions:
 - i. That individual agents act rationally
 - ii. That markets operate efficiently.

Agents acting rationally implies that stock holders will adjust other expectations in response to new information; markets operating efficiently means that they will immediately incorporate new information into market prices.

Though the market over a period of time operates rationally, there come brief periods when the herd instinct takes over and the demand far outstrips the supply (or vice versa). This leads to the asset prices increasing in the short run but in the long run, the sustainability of the growth is affected by larger performance of the units that constitutes the macro growth. This gets reflected in the asset prices. Hence, the proverbial bursting of the bubble.

Considering Indian market, different experiments conducted till date have found the market efficient in the weak-form i.e. historical prices do not determine future price. However, semi-strong form and strong form have yet not been reached in India that is, while market information may not give any profits in the long run, insider information may do so.

10. The appropriate method to calculate the market value depends upon the way the property is acquired.

	Alternative	Method
1.	Buy an existing one	Market or Direct Sales Comparison approach
2.	Buy a clear site and develop it	Cost approach
3.	Buy a property with same Risk Return characteristics	Income approach

Here we discuss briefly the steps involved in the three approaches stated above.

I. **Market or Direct Sales Comparison Approach**

The steps involved in this method are:

1. Select properties which have similar characteristics to that of the subject property.
2. Then subdivide them into units so that it would aid us in comparing and performing calculations.
3. Then adjust the sales figures with that of the subject property and
4. Estimate the market value of the subject property.

II. **Income Approach**

Here, we have two methods. They are:

- a. Gross Income Multiplier method:

The steps involved in this method are:

1. Ascertaining the gross market earnings of the subject.
 2. Calculating the gross income multiplier and
 3. Estimating the value of the said property.
- b. Direct Income Capitalization method.

The steps involved in this method are:

1. The calculation of the net operating income of the subject
2. Deriving the income capitalization rate from the market and
3. Estimating the market value of the subject.

Now, we look at the application part of this method.

Estimation of Market Value for Income Producing Property:

For a property which gives us regular returns, the market value is calculated in a similar way as we calculate net present value of cash flows from a financial asset. The formula is

$$MV_0 = \sum_{t=1}^n \frac{NOI_t}{(1+r)^t} + \frac{MV_n}{(1+r)^n}$$

Where the notation are in their standard use.

If we assume that this property changes hands infinite number of times, then the market value of the property is given by

$$MV_0 = \sum \frac{NOI_t}{(1+r)^t}$$

If the net operating income grows at a rate of “g” annually, then

$$MV_0 = \frac{NOI}{r-g} = \frac{NOI}{R_0}$$

Where NOI is the net operating income growing at a constant rate of “g”.

The term (r – g) is the capitalization rate “R₀”. When the rate of inflation is high, one would find a very low value of capitalization rate. Capitalization rates are net of appreciation or depreciation.

Derivation of the Capitalization Rate

To derive this rate, the following methods are employed. They are

1. Market Extraction Method

In this method we select comparable properties. For these properties’, we require net operating income and current market price. When the net operating income is divided by the sales price, we get the capitalization ratios. From these ratios, we choose a rate which reflects the market sentiment.

2. Band of Investment Method

In this method, the rates on equity as well as debt financing are weighted according to their proportions to calculate the capitalization rate.

3. Built-Up Method

In this method, the capitalization (Built-Up) rate is the sum of the following rates. They are

- i. Rate on an asset being non-liquid
- ii. The rate for risk
- iii. Pure interest or the risk-free rate and
- iv. Recapture premium (a return of investment).

III. Cost Approach

The steps involved in this are

1. Estimating the market value of the site
2. Estimating the improvisation or development charges
3. Estimation of depreciation charges and deducting them from development charges and

4. Estimating the market value of the property in question.

11. In their effort to explain the existence of market bubbles, some economists have proposed that bubbles may, in fact, be rational. For example, suppose investors find that stock prices are diverging from their fundamentals and are being driven by factors unrelated to fundamentals i.e. a bubble exists and that it will burst at any time in future. Accordingly, investors are accepting a higher than normal risk by holding the stock another day and, consequently demand a higher return. But the above example does not explain what circumstances gave rise to the bubbles, or what events led to their eventual collapse.

More often than not, bubbles seem to form because a group psychology overcomes investors, who start making decisions based on a perceived frenzy rather than change in the fundamentals.

Caselet 3

12. The regional stock exchanges in India had proliferated in the country due to historical reasons. The smaller companies which were having little national presence but were reputed in their respective regions could access the capital market funds through the regional stock exchanges.

It is true that due to technical innovation and spread of online trading in the remote parts of the country is having a telling effect resulted in near zero trading at regional exchanges. Abolition of regulatory requirement of compulsory listing may prove to be a death knell to these regional exchanges. However, these regional exchanges still have a role to play in the capital markets. In fact, the recent scams in capital market indicate as following:

- i. It is very difficult to develop a thriving capital market without a strong regional dimension.
 - ii. The new system has clearly failed to cater to small investors and mid-cap companies in equal measure.
 - iii. The volatile stock market is not giving the stable return opportunities sought by pensioners.
 - iv. Strong commodities futures market are also required by farmers. But the speculators in Indian markets have little interest in commodities.
13. The regional exchanges are facing the present threat of closure because the regional exchanges long ago stopped these role of reaching out to new small investors as well as local companies. They tended instead to join the speculative bandwagon.

Considering the present scenario the steps that should be taken by these regional stock exchanges are as under:

- i. Recognize their role of providing access to the capital markets to small investors and small-cap companies.
- ii. Stock exchanges promoted by broking community should reflect their basic instinct of being flexible and spotting new opportunities. The Bangalore Stock Exchange has already set up a subsidiary, which deals with NSE and BSE. And this route is open to other regional stock exchanges as well.
- iii. Set up a stock exchange on the lines of Nasdaq's small cap market using the network of regional stock exchanges to address the requirements of
 - a. Small investors and small cap companies
 - b. Need of stable returns of pensioner
 - c. Development and taking commodities futures markets at the door step of farmer community.
 - d. Providing much need breadth and depth to capital markets.