FUNDAMENTAL APPROACH TO VALUATION OF SECURITIES – A STUDY WITH REFERENCE TO INFORMATION TECHNOLOGY (IT) SECTOR SHARES IN INDIAN STOCK MARKET

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Certificate

Certified that the thesis entitled *"Fundamental Approach to Valuation of Securities – A Study with reference to Information Technology (IT) Sector Shares in Indian Stock Market"* is a bonafide record of research work done by Shri. T.G. Saji under my supervision and guidance. It is further certified that the thesis is not previously used for the award of any Degree, Diploma and Fellowship or for awarding other similar titles of recognition.

He is permitted to submit the thesis to the university.

Kochi   **DR. S. Harikumar**

July 2011.   *(Supervising Guide)*

Declaration

I, T.G Saji, do hereby declare that the thesis entitled **"Fundamental Approach to Valuation of Securities – A Study with reference to Information Technology (IT) Sector Shares in Indian Stock Market"** submitted to Cochin University of Science and Technology, Kochi - 22, for the award of the Degree of Doctor of Philosophy under the faculty of Social Sciences, is the record of original and independent research work done by me under the supervision and guidance of Dr. S. Harikumar, Professor, Department of Applied Economics, Kochi - 22. I further declare that this thesis has not previously formed the basis for the award of any Degree or Diploma or Fellowship or other similar titles of recognition.

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INTRODUCTION AND DESIGN OF THE STUDY

1.1: Introduction

Economies need funds for their development and growth. The fund requirements of these economies are usually met from the surplus economic units or savings. A surplus unit can be an individual, a firm or the government whose income exceeds the consumption during the period under consideration. By making use of these funds the economies purchase assets such as land, building, knowledge and machines, generate income and then allocate the same among the suppliers of funds. This phenomenon will be continued as far as an economy is in its growth phase. So for attaining sustainable growth and development of an economy there should be an environment conducive for the savings and investment growth. In their study, Dailami and Atkin (1990) shows that the provision of funds to finance domestic capital formation is a key factor for the prospects for long term economic growth of developing countries.

Investment is an important means for channelizing the idle savings into the development of the economy. The material wealth of a society is determined ultimately by the productive capacity of its economy – the goods and services that can be provided to its members. Investment raises the level of aggregate demand which in turn increases the level of income and employment in the economy (M. Yogesh, 2008).

1.1.1: Investments –Financial and Economic meaning

From the financial stand point of view of investors or suppliers of capital, investment is the commitment of present funds in order to derive future income in the form of interest, dividend, retirement benefits, or of appreciation in the value of the principal. So the allocation of money over assets that is to yield some gain over a period is financial investment. It is an exchange of financial claims for money and is expected to yield returns and experience capital growth over the years. In fact most investments in popular sense are transfers of financial assets from one person to another.

The ideas on the nature of investment in the financial or popular sense should be contrasted with its meaning in the economic sense. In the latter context the term investment implies the formation of new and productive capital in the form of construction, new producers' durable equipment or additional inventories (Dougall and Corrigan, 1978). It is the investment in real assets that brings about the production of goods and services for the purpose of maximizing the present value of owner's equity. But from the view point of financial investment whether the money saved and invested is devoted to a 'productive' use is not important. Similarly it does not matter whether the funds are to be used for new assets. The purchase in the open market of a 'second hand' instrument such as bond or share is just as much as an investment as the purchase of a security issued for new capital.

However, the financial and economic meanings of the investments are related. A part of the savings of individuals which flow into the capital market

either directly or through institutions are devoted to new permanent capital financing. Investors as suppliers and investors as users of long term funds thus find a meeting place in the capital market. When the real assets used by a firm ultimately generate income, the income is allotted to investors according to their ownership of financial assets or securities issued by the firm. In this study the term investment will be used in its financial sense.

1.1.2: Investment in securities

One of the prime components of financial investment made in every economy is securities. A security is a document that evidences specific claims on a stream of income and/or to particular assets. Debt securities include bonds and mortgages. Ownership securities include common shares (equity shares). In addition preferred stock/ preference share is a hybrid security which entitles its owners to a mixture of both ownership and creditor ship privileges.

Common stock is the first security of a company to be issued and the last to be retired (Francis, J. Clark, 1986). It represents the share in the ownership of a firm. It has the last claims on earnings and assets of all other securities issued. But it also has an unlimited potential for dividend payment through increasing earnings and for capital appreciation through rising prices.

The valuation of common stock/equity share is much more difficult than that of other securities. To determine the value of a common stock, three important variables must be dealt with. First, the amount of future earnings or when they will be earned is not known precisely. Second, the amount and the timing of dividend income is uncertain. Third, the value that will be given to future earnings and dividends of the company by the investor is unknown and uncertain. Therefore it is difficult to determine the future price. If all these variables were known – that is with complete knowledge and certainty about future earnings, dividend, price and risk associated with common stock investment – making a decision could be relatively easy. Since practically such precise knowledge about the future is

unavailable, an investment in common stock demands that future earnings, dividend and price are to be estimated. The risks involved must be determined and then weighted against the estimated yield to decide whether the stock is overpriced, fairly priced or underpriced that is, whether the stock is overvalued, fairly valued or undervalued (Amling Frederick, 1978).

1.2: Review of Literature

For identifying the research gap the study has reviewed the empirical findings of considerable number of research studies on various dimensions of stock market investments and its price behavior in various markets across the globe at different points of time.

Dow (1920)[1] has been the pioneer in making a systematic study on the prediction of future stock prices or stock returns. He has studied the potential for past share prices and movement therein, to predict future equity values in US stock market. He proved the ability of the technical analysis to explain current and future share prices as well as equity returns.

Cowles (1934) showed that trading based upon Dow Theory would have resulted in earning less than a buy and hold strategy using a well diversified portfolio. The study concluded that a buy and hold strategy produced 15.5 per cent annualized returns for the period 1902-1929 from US market, when Dow strategy produced annualized return of 12.0 per cent during the same period. Cowles analysis was a land mark in the development of the empirical evidence on the informational efficiency of the market.

Graham and Dodd (1934) are among the first to formally argue the importance of fundamental factors in share valuation exercises. They suggested that the stock owner should not be too concerned with erratic fluctuations in stock

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[1] Infact it dates back to a series of 255 editorials published by Charles H Dow in Wall Street Journal for the period 1900-1902

prices, since in the long term its true value will be reflected in its stock price. Hence the investors spend time and effort to analyze the financial state of companies and then assess its intrinsic value before making his final investment decision.

Gordon (1959), in his study based on the data relating to four industries from US economy for the period 1951 to 1954, very compactly illustrated the connection between a stock's price, the current level of dividend, the expected growth rate of dividends and the discount rate. His study showed the relevance of dividend in determining intrinsic worth of a stock thereby the stock returns also. But Modigliani and Miller (1961) showed investor indifferences as to the amount of dividend since it has no influence on the value of a firm. Any investor can create a 'homemade dividend' if required or can invest the proceeds of a dividend payment in additional shares as and when a company makes dividend payment.

Holt (1962) made a study for measuring the influence of growth duration of earnings on share price movements. He found that the forecasting of future earnings and other economic variables become more difficult if the rate of growth is expected to change in the future. So estimation of growth rate not only in terms of its size but also its duration must be made for correct valuation of a stock.

Sharpe (1964) and Lintner (1965) predict a positive linear relationship between expected security returns and market betas with their Capital Asset Pricing Model (CAPM). The model is developed under the assumption of the existence of an efficient capital market where security transactions are costless and information is freely available to all investors instantaneously. CAPM, in such an idealized market environment, bifurcates total risks involved in investments into two orthogonal parts, risk associated with the overall market conditions called 'market risk' or 'systematic risk' and risk specific to the asset called 'unique risk' or 'unsystematic risk'. The unsystematic portion of the risk can be eliminated by holding well-diversified portfolios but the systematic portion cannot be eliminated

even if one virtually holds all assets in the economy. The CAPM also predicts that market beta is sufficient to describe cross-sectional expected returns. These predictions have been the subject of a great deal of empirical investigation. Much of the evidence does not support the model. Empirical contradictions of the CAPM are documented in Banz (1981), Reinganum (1981), Basu(1983), Rosenberg, Reid and Lanstein (1985) and Bhandari (1988).

King (1966) in his study returns for a sample of 63 stocks in six different industries was examined over the time period 1927-1960. The study used multivariate analysis to decompose the causes of price movements in the stocks he studied. On averaging the overall the industries he studied, King found that 20 per cent of the stock price movements were the results of factors unique to each firm, 31per cent due to general market factors, 12 per cent were the result of industry factors and 37 percent were the result of factors tied to industry subgroups.

Malkiel and Cragg(1970) studied the effect of historical growth of earnings, dividend payout ratio and stock's rate of return relative to the market in determining P/E. Earnings growth was found to have a positive effect on the P/E ratio. The closer a stock's return followed that of the market; the more negative the P/E effect. The dividend payout effect was not clear; in some years, the higher the payout the higher the P/E, but this was not true for all years.

Sharpe and Cooper (1972) conducted a study concerning the relationship between risk and return on the basis of 10 risk classes of NYSE common stocks over the period 1931-1967. The risk classes were determined by estimating the beta of each stock at the beginning of each year. The results of the study proved consistent relationship between risk and return. Black et.al (1972) and Fama and Macbeth (1973) also confirmed the basic tradeoff between risk and return. While preponderance of the historical evidence does suggest that higher returns are associated with riskier securities, the relationship is not perfect, particularly over relatively short time periods.

Niederhaffer and Regan (1972) had performed a specific test of the relationship between earnings and prices of selected stocks listed in NYSE for the period 1966-1970. Their study has found changes in stock prices are highly correlated with changes in earnings. An investor with superior earnings forecasts is more likely to enjoy pleasant surprises and avoid disappointing earnings reports and stock performance.

Meyers (1973) and Livingston (1977) in similar studies confirmed King's findings. The Meyer's study involved 60 of the same companies used by King (1966) and 60 additional companies, using data through December 1967. Meyers concluded that although there was strong industry effects, King may have overstated the per cent of residual variance explained by industry association. Livingston used 50 companies in 10 industry groups and studied monthly returns from January 1966 through June 1970. He also found strong co movement among stocks in the same industry, and concluded that 18 per cent of residual variance was accounted for by industry effects.

Sharma and Kennedy (1977) and Sharma (1983) test the weak-form efficiency of the BSE. Both of these studies with the former covering the 1963-1973 periods and the later encompassing the 1973-1971 period, conclude that Indian stocks generally conformed to random-walk behavior and in the successive period changes were independent. Poterba and Summers (1988), however, find evidence of mean reversion in Indian stock prices, suggesting a deviation from random-walk behavior.

Basu (1977) in his study found that the security prices over the period from 1957 to 1971 in US market not completely described by the Efficient Market Hypothesis (EMH). He argued that publicly available Earnings Price (EP) ratio seems to possess information content and may warrant an investor's attention at the time of portfolio formation or revision. Based on this analysis, he argued that for

the 14-year period studied, high E/P securities have higher expected returns than predicted by CAPM.

Shleifer (1986) was among the first to investigate the index effect and his study examined price impacts related to changes in S & P 500 between 1966 and 1983. His study found an abnormal price increase of 2.79 per cent and the cumulative returns persisted. The returns are positively related to measures of buying by index funds and the results were attributed to the downward sloping demand curves for stocks.

Fama and French (1988) found that the predictability of stock price return variances was larger than expected in the US stock market for the period 1926-1985. The predictable variances of three to five year stock price returns were estimated to be about 40 per cent for portfolios of small firms and 25 per cent for portfolios of large firms. They also observed strong negative autocorrelation of stock returns over a three to five year period in their multi period returns regression model. The negative autocorrelation of stock returns implies Mean reversion in stock prices.

Barth et.al (1990) made an empirical examination between common stock prices and two major components of bank earnings shows that earnings before securities gains and losses play an important role in explaining bank stock prices. The market appears to assign a significant multiple to this component of earnings, judging from regression results over the 1968-87 period.

Gupta (1992) in his study examines the volume and nature of speculation in Indian stock exchanges with focus on effects of excessive speculation. He points out the most important weakness of Indian stock market in the existence of unhealthy and excessive speculation resulting in irrational price behaviour and very high volatility.

Fama and French (1993) introduced a 'Three Factor Model' in the spirit of arbitrage pricing theory. They argued that the effects of size and book equity - to-market equity could be explained as manifestations of risk premiums. Using an arbitrage pricing type model they show that stocks with higher sensitivity on size or book-to-market factors have higher average returns. According to them risk is determined by sensitivity of a stock to three factors (1) Market portfolio, (2) a portfolio that reflects relative returns of small verses large firms and, (3) a portfolio that reflects relative returns of firms with high verses low book-to market ratio firms. They argued that even though size and book to market equity ratios are not direct factors affecting returns, they perhaps might be proxies for more fundamental determinants of risk. Thus they conclude that these patterns of returns are consistent with efficient market hypothesis in which expected returns depend solely on risk.

Mittal (1994), using daily returns data of BSE National Index for the period January 1990 to February 1993, shows that daily returns are most negative for Tuesday and most positive for Friday. Hence, investors can make use of this information to make excess returns by trading in National Index portfolio.

Chiang et.al (1995) based on the earnings and dividends as proxies for fundamental values, show that the larger the difference between the stock price and the fundamental asset value the stronger will be restoring force of the movement of stock price towards the fundamental value. But Wigmore (1997) showed that the share prices increased much more than their intrinsic values in the 1980's and only 35 per cent of the 245 point rises in the S&P 500 during the 1980s was explained by changes in fundamental values.

Classens (1995) in his study on equity investment in developing countries found that the benefits available to a foreign investor in emerging markets ultimately depend upon a tradeoff between the expected rate of return and its associated risk. For assessing this kind of relationship he considered the

underlying factors which are influencing the rate of return and its variability, the efficiency of the domestic stock market and the working of the regulatory mechanism in the host country. The study revealed that due to the correlation between equity returns from different countries is much lower than that between equity returns in the same country, the benefits of diversification-a lower risk for same or higher rate of return or a higher return for same or lower level of risk-are much stronger across international financial markets than within domestic markets.

Bae and Duvall (1996) applied multi-index CAPMs to explore the relationships of US aerospace industry stock returns to selected market and industry variables during the period 1982 -1991. The study found that the market returns represented by the S&P 500 index and Department of Defense expenditures are significantly positively related to aerospace stock returns.

Madhusoodanan (1997) conducted a study to find out the relationship between the expected return and risk by using portfolio method rather than the individual security approach. For the purpose, portfolios were formed to test their performance in the consequent period. Results indicated that the risk and expected return in the Indian market are not necessarily positively related. Moreover In Indian market, the investor rationality and risk aversion do not appear to be important.

Sehgal (1997) empirically tested three-parameter Capital Asset Pricing Model in Indian capital market by taking monthly rates of return (adjusted for bonus, stock splits and right issues) for 80 securities included in BSE National Index. The evidence indicated that CAPM is not a suitable descriptor of asset pricing on the Indian capital market for the period of the study. Slope was found negative but insignificant for the total period, implying absence of any significant relationship between beta and average return.

Ajit Singh (1998) examines the growth and evolution of stock markets in India during the 1990's, which according to him is largely due to internal and

external liberalization measures and the general liberal economic ethos created by the reforms. Singh argues that even though the corporate sector considerably benefited from the boom in the stock market by raising huge amount of capital from the market, the aggregate real economy did not benefit from this. What really happened was a portfolio substitution by households and institutions from bank deposits to financial corporate securities. Also Singh does not see any increased productive use of investment resources.

Brown et al. (1998) challenged the efficient Market Hypothesis and proved the validity of Dow theory in producing excess risk adjusted returns to the investors. More specifically the return of a buy and hold strategy was higher than a Dow theory portfolio by 2 per cent, but the riskiness and volatility of the Dow theory portfolio was lower, so that it was able to produce higher risk adjusted returns to its investors in US market.

Sullivan et al. (1999) report that although data snooping biases might not explain the historical possibility of trading based on technical analysis, such trading practices are no longer viable given the increased efficiency of equity markets afforded by cheaper computing power, the lower transaction costs and increased liquidity.

Ramasastri (1999) applied the unit root test to examine the existence of weak form of capital market efficiency in India in the wake of recent capital market reforms. He used daily closing prices of SENSEX for a period of eight years from January 1991 to December 1998 for the analysis. The study concludes that Indian capital market is weakly efficient during the study period.

Tomy Varghese (1999) analyzed the perceptions and attitudes in the individual investors in the primary market in Kerala. The study revealed that among the various factors that influenced the investment decisions in the capital market, investors have given top priority to the track record of companies and their promoters. Other important factors are the highlights of the issue and the product

mix of the company. Risk factors and ratings given in the publications also influence their investment decisions.

Chordia and Swaminathan (2000) examined the predictability of short-term stock returns based on trading volume and concluded that high volume stocks respond promptly to market-wide information. Wang (1994) developed a model based on asymmetric information and showed that the trading volume is related to information flow in the market and investor's private information is revealed through trading volume.

Chaturvedi(2000) examined the existence of P/E effect in India by using a sample of 90 scrips for a six-year period 1990-1996. He concludes that significant P/E effect exists in India during his study period.

Jegadeesh and Titman (2001) has verified the profitability of momentum strategies suggested by the technical analysts. Their research found the profitability of buying a portfolio of past 'winners' and simultaneously short selling a portfolio of past 'losers', then holding the resultant position for 3-12 months, which challenge the validity of Efficient Market Hypothesis.

Nishat and Irfan (2000) identified the joint effect of multiple factors in Karachi stock exchange during 1981-2000. Out of the six fundamental factors, only four has impact on share prices – payout ratio, size, yield and leverage.

Tuli Nishi and Mittal (2001) made an attempt to determine price earnings ratio of 105 companies in India for the period 1989 -93 and found variability in market price, dividend payout ratio and earnings per share to be significant variables whereas size, debt equity ratio and growth were significant.

Cauchie et al. (2002) through their research paper investigated the determinants of stock returns in a small open economy in an Arbitrage Pricing Theory framework. The analysis is conducted with monthly data from the Swiss stock market over the period 1986-2000. They used data on industrial sector

indices, as well as macro-economic data. They found that Swiss equity returns are influenced by both global and domestic economic conditions. The results also show that the statistically determined factors yield a better representation of the determinants of stock returns than the macro-economic variables.

Mohanty (2002) examined the effect of a number of firm specific characteristics, such as size, book-to-market equity ratio, price earnings ratio, book leverage, market leverage, price-to-cash flow ratio, price-to-sales ratio, and market beta in explaining cross sectional variations of stock returns over the period 1991to 2000. By using Fama and MacBeth (1973) methodology on individual securities of the sample, he found variables' size, market leverage, book-to-market ratio, and price-earnings ratio are significant in explaining stock returns, of which size is the most significant variable. Moreover, he observed that variables other than size did not have any additional explanatory power, once the size effect had been adjusted for. This implies that size captures the effects of the other variables in Indian stock markets.

Malakar and Gupta (2002) took an effort to explain the major determinants of sectoral stocks in Indian stock market. Their sample consists of eight major cement companies India and study covered the period from 1968 to 1988. The study has found earnings per share and investment expenditure to be significant determinants of share price.

Lee and Ryan (2002) analyze the dividend signaling-hypothesis and the issue of direction of causality between earnings and dividends - whether earnings cause dividends or vice versa. For a sample of 133 dividend initiations and 165 dividend omissions, they found that dividend payment is influenced by recent performance of earnings, and free cash flows. They also found evidence of positive (negative) earnings growth preceding dividend initiations (omissions).

Lanne and Saikkonen (2004) analyzed monthly excess US stock returns from January 1946 to December 2002. The results indicate the presence of

conditional skewness in stock returns. This is because large pieces of news persist, which increases not only present but also future volatility. The evidence seems to suggest that there is informational efficiency and stock prices can be predicted with a fair degree of reliability.

Samanta (2004) carried out spectral shape tests for daily data on the BSE-100 from January 1993 to December 2001. He partitioned the entire period in to 18 sub-periods and tested separately for each sub-period. The study showed that the market was considerably inefficient during each sub period till June 1996. It achieved high level of efficiency during July 1996 to December 1999 and showed efficiency at a relatively lower level thereafter, except with some aberration during 2000.

Mishra (2004) examined the relationship between stock market and foreign exchange markets in India using Granger causality test and Vector Auto Regression technique .They used monthly data for stock return, exchange rate, interest rate and demand for money for the period 1992 to 2002. The study found a unidirectional causality between the exchange rate and interest rate and also between the exchange rate return and demand for money. The study also suggested that there is no Granger causality between the exchange rate return and stock return.

Nath and Dalvi (2005) examined the day of the week effect anomaly during 1999 to 2003 for Nifty. They found market inefficiency exists in Indian stock market. Dhankar and Chakraborty and Dinakar (2005) also confirmed this finding and the variance ratio test applied by the study suggests dependency of SENSEX series, thereby utility of technical analysis in predicting stock price behavior

Ahamed et al. (2005) in their effort to study the integration of Indian stock market with the global markets, after analyzing the daily closing data of NASDAQ, Nikkei and SENSEX from 1999 to 2004 found that there is no long-term relationship of the Indian stock market with the US and Japanese markets.

Courteau et al. (2005) assessed the relative performance of the direct valuation method and industry multiplier models using firm-quarter Value Line observations over an 11 year (1990–2000) period. Results from both pricing error and return-prediction analysis indicate that direct valuation yields lower percentage pricing errors and greater return prediction ability than the forward price to aggregated forecasted earnings multiplier model. However, they suggested a simple hybrid combination of these two methods leads to more accurate intrinsic value estimates, compared to either method used in isolation. It would appear that fundamental analysis could benefit from using one approach as a check on the other.

Ahmad M Khan et al. (2006) made an attempt to seek evidence for the weak form efficient market hypothesis using the daily data for Sensex and Nifty for the period 1999-2004. The random walk hypothesis for the Sensex and the Nifty stock indices were rejected and the study also found the inefficiency of Indian stock market with high and increasing volatility. Both the indices showed a negative autocorrelation at lag 2, indicating over-reaction on day after information arrival, followed by a correction on the next day.

Sehgal and Tripathi (2007) investigated value effect in the Indian stock market by using alternative value measures such as book equity-to-market equity (BE/ME), earnings-to-price (E/P), cash flows-to-price (C/P) and dividends-to-price (D/P). The basic data consists of month end adjusted prices of 482 companies forming part of BSE 500 equity index over the period 1990- 2003. The study reports existence of statistically significant value effect on unadjusted as well as risk-adjusted basis on all the value measures used. The study also found operating profitability, size and financial leverage as the three important sources of value effect.

Chandan Sharma (2008) in his study based on annual data of fourteen developing economies for the period from 1990 to 2006 found no direct

relationship between stock market development and economic growth. Shan and Morris (2002) find weak evidence that financial development leads economic growth, either directly or indirectly.

Shahid Ahmed (2008) examined the nature of the causal relationships between stock prices and the key macro economic variables representing real and financial sector of the Indian economy for the period March, 1995 to March, 2007 using quarterly data. The results of the study revealed differential causal links between aggregate macro economic variables and stock indices in the long run. However it revealed that causal pattern is similar in both markets in the short run. The study results indicate that stock prices in India lead economic activity except movement in interest rate. Interest rate seems to lead the stock prices.

Ray et al. (2008) made an attempt to unravel the relationship between the real economic variables and the capital market in Indian context. They considered the monthly data of several economic variables like the national output, fiscal deficit, interest rate, inflation, exchange rate, money supply, foreign institutional investment in Indian markets between 1994 and 2003, and ascertained the relative influence of these variables on the sensitive index of the Bombay stock exchange. Compared to the earlier similar attempts, they applied the modern non-linear techniques like VAR and Artificial Neural Network. The finding shows that certain variables like the interest rate, output, money supply, inflation rate and the exchange rate has considerable influence in the stock market movement in the considered period, while the other variables have very negligible impact on the stock market.

Based on CAPM as theoretical framework and the samples of size varying from 182 companies to 544 companies for various estimations period between April 1991 to March 2006 Francy (2008) provides empirical validity of the Three factor model of Fama and French(1992) in determining stock returns in India. The explanatory power of the three-factor model was found to lie between 69 per cent

and 90 per cent for the various portfolios constructed which shows that the three-factor model has captured the majority of the positive returns that had been left unexplained by the CAPM in Indian context.

Bettman et al. (2009) made an attempt to assess the relative ability of fundamental and technical analysis to explain share prices based on the data pertaining to US listed companies that spans the period January 1983 through December 2002. For this purpose they incorporated both fundamental factors (Book value and EPS) and technical factors (lagged share prices and momentum factors – extreme past return performance) in their hybrid dummy regression models. The test results of the study confirmed the complementary nature of the two approaches in stock valuation by showing that, although each performs wells in isolation, models integrating both have superior explanatory power. Taylor and Allen (1992) also verified the complementary nature of technical and fundamental analysis.

Brajesh Kumar and Prayanka Singh (2009) empirically examined the relationship between returns, volatility and trading volume for 50 Indian stocks. Three measures of trading volume namely number of transactions; number of shares traded and value of shares traded are used. It is found that in Indian stock market, the number of transactions may be a better proxy of information than the number of shares traded and the value of shares traded. The evidence for positive contemporaneous relation between returns and volume as well as conditional and unconditional volatility and volume is found. They also found that the level of volume is dependent on the direction of price change only in case of 60 per cent of the stocks in the sample.

A.S. Ahmed et al. (2009) provides empirical evidence on factors that drive differential interpretation of earnings announcements. The study suggests that investor disagreement can increase investment risk, increase the cost of capital, and cause stock prices to deviate from fundamental value and by increasing the quality

of earnings and pre-announcement information can improve the efficiency of capital markets.

Deutsche Bundes Bank (2009) in its study based on stock price movement in DAX for the period 1991 to 2009 tested and proved that corporate earnings is an important fundamental determinant of stock returns in Germany. The Impulse Responses Function generated by the Vector Auto Regressive (VAR) model used in the study confirmed direct reaction by stock yields to changes in earnings expectations.

1.3: Research gap

On surveying the existing literature available on the equity research it is identified that studies verifying the determinants of stock returns have already been made in Indian context, though not extensive. But the divergence in findings of these studies often confuses the millions of investors in the country – which approach they should follow and what factors they have to consider as the base for the valuation of their stock investments. A single study investigating the usefulness of fundamental approach in valuation of equity shares in India through an Economy –Industry – Company framework based on a uniform time period has not been found. This makes the research in this area often incomplete and bias. Again most of these studies giving thrust only to identify the prominent factors which determine the stock returns in India during a particular period. In fact they have not made any attempt to examine the ability of these factors to forecast the share prices/returns in subsequent periods, and thus failed to give sensible and concrete solutions to problems persisting in the valuation of stocks in the Indian capital market. Studies leading to the decision as to how the performance of a particular sector or firms in the group specifically affects the returns of that sectoral stock and the nature of relationship between the factors determining its performance and stock returns are rare among the research works of this kind. The present study titled 'Fundamental approach to valuation of securities – A study with reference to

Information Technology (IT) sector shares in Indian Stock Market" is expected to fill these gaps in the equity research base in India.

1.4: Importance of the study

Even though as a part of economic liberalization measures in the country the capital market reforms have been initiated in India since 1991, it has not acknowledged much mileage until 2000. For the last ten years, there has been a remarkable development in Indian capital market and which is clearly visible there in both market breadth and volume terms. The present study spans from 2000 to 2010, to judge the impact of capital market reforms on the stock market performance in India. Decisions taken within the framework of the firms play a significant role in driving equity prices under the new policy regime (Kakani et al. 2001). So a study relating to valuation of equity shares covering this period could produce more fruitful results than those produced by similar works based on different timeframe.

With changes taking place at terrific pace in the field of investments, it has become a specialized activity demanding scientific plans and procedures for success. Availability of large number of innovative product alternatives has added complexity to the process. One is therefore required to master the science of investing in order to optimize his investment function. Since equity share is one of the important media of investments among the aforementioned group a study of this kind focusing on the general as well as specific factors important in explaining share prices shall definitely help the investors to acquire substantive knowledge on equity investment management and can devise active investment strategies in accordance with their investment objectives and resource constraints. By understanding the dynamic nature of the relationship between these factors and stock prices, the prediction of stock price behavior would be much simpler for them. They need not be gone after the rumors and rationality shall guide the investors in their investment valuation mechanism.

The study might also be relevant to Institutional investors, pension funds and governments as many of these long term investors base their investment in equities on the assumption that corporate cash flows should grow in tandem with the economy, given either a constant or slowly moving discount rate. Thus they can link the expected return on equities to future economic fundamentals. Using these knowledge the policy makers may try to influence the stock markets with the help of effective fiscal/monetary measures and corporate may design and draft appropriate financial and business policies to improve their earnings and financial conditions under the expectations of increased values for their stocks in the market.

Information Technology is of recent origin, but it is spreading fast in India. As per the study of NASSCOM-Deloitte (2008), the contribution of IT/ITES industry to the GDP of the country has soared up to a share of 5 per cent in 2007 from a mere 1.2 per cent in 1998. A number of large, profitable Indian companies today belong to the IT sector and a great deal of investment interest is now focused on this sector. Companies from this sector such as Infosys Technologies, Wipro, TCS etc are constituents of major benchmark indices in India – Nifty and SENSEX, thereby to an extent decide the general price movement in the market. But on the other side compared to other sectoral stocks in India, Information Technology stocks in general are less profitable and more volatile (detailed in Chapter 4 of this report) which is really paradoxical to the basic principle of investment. By assessing the structure of Indian IT Industry and the financial health of its member firms investors can definitely make out the exact reason for this absurdity. It shall also help him to trace out the prominent factors behind the success of profitable stocks from the sector which could be a strong basis for his investment decisions pertaining to this sector or similar sectors in future.

1.5: Research problem

The empirical studies conducted in India as well as abroad on the validity of fundamental approach in valuation of stocks have produced mixed results. There are empirical studies reported from the world markets as well as from Indian market supported the efficacy of fundamental approach in long term investment decisions. Several other authors questioned the validity of this approach in producing superior returns to investors. Even those researchers who are positive to this approach, differences of opinion have expressed as to the variables relevant in explaining the stock price behavior in many of the markets they had observed. Some studies have identified some critical variables greatly affecting the share price behavior in a particular market, while some others have found the same group of these variables insignificant in capturing its relationship with stock prices in the same market or at least in another market. These issues which are common to different capital markets across the globe raise the following questions in connection with Indian capital market:- Is the fundamental approach to valuation of stocks bring superior returns for investors in Indian capital market after the recent capital Reforms? Are there any macroeconomic variables in guiding the general price movement in the market? Are the different sectoral indices India have exhibited the uniform risk-return profile, if not, what factors have contributed to such divergence? Are there any firm specific variables that have additional explanatory power in explaining the cross sectional variations of equity returns in India? Is the PE ratio as a tool of Value investment strategy able to identify the mispriced securities in Indian stock market conditions?

The present study is an attempt to answer these questions through an in depth empirical research by using data taken from India stock market.

1.6: Objectives of the study

The main objective is to study the usefulness of Fundamental approach in valuation of equity shares in Indian stock market context. For supporting the main objective, the following sub objectives are also framed out.

1. To analyze the macroeconomic environment of India for knowing its impact on the general price movements in its stock market.

2. To explore the relevant industry variables which cause divergence in the market performance of indices representing equity securities of different industrial sectors in India.

3. To identify the specific company factors which determine the stock returns of firms belonging to Indian IT industry.

4. To evaluate the efficacy of Price Earnings strategy as an analytic device for making successful equity investments in Indian stock market.

1.7: Hypothesis used in the study:

Stock price movement in India is mainly determined by a host of Economy, Industry and Company fundamentals in the long run. So the Fundamental approach to valuation of shares can produce superior returns to long term equity investors in India.

1.8: Database and methodology

1.8.1: Database

The study is based on secondary data. Data related to Indian economy have mainly collected from official publications of Government of India, Central Statistical Organization (CSO), Reserve Bank of India (RBI) and Securities and Exchange Board of India (SEBI) and stock price data have obtained from NSE database. Both industry and firm level data have been collected from databases of

Prowess (CMIE), Capital Line and CRISIL and also from annual reports of companies. In addition to this, publications of Trade bodies such as NASSCOM, reports of various National and International research firms, Reports, Journals, Periodicals, Text books, News papers etc. have also sourced for other data relevant to the study. Almost all these data were related to the period 2000-01 to 2009-10(Financial Years).

1.8.2: Methodology

Simulation, Run Test and Auto Correlation Function have been applied for formulating the base hypothesis of the study. Unit root tests (ADF and PP) were used for checking stationary property of time series data. VAR, Impulse Responses Function and Variance Decomposition techniques have been applied for capturing the causal relation between stock returns and macro economic performance of India.

Stepwise regression method (Max R method) has been used for identifying the key industry variables which determine the stock returns in India. Michael Porter's industry analysis model has been followed for assessing the competitiveness and structure of Indian IT industry. With the help of Financial Accounting ratios, the financial health of companies was assessed. Factor analysis and OLS regression model has been used for making statistical analysis on the firm level financial performance and corporate stock returns in India.

Data used for the analysis and further explanation of the methodology as to its relevance and use are detailed in respective Chapters.

1.9: Limitations of the study

Window dressing practices adopted by corporate in their published financial reports for giving rosier picture on their business often be a major problem in deciding the quality of the data provided by such reports. Since the major input for this research work is published financial data related to corporate firms in India, the

quality of such data over a long period range might be a great challenge. Since the specific objective of the study is the empirical evaluation of Indian stock markets in terms of fundamentals of companies representing Indian Information Technology (IT) industry, the dissimilarity in nature and structure of this sector relative to other sectors in India may cause some problems in making generalizations as to the determinants at firm level in explaining the variations in stock returns in India. Hence the price behavior of stocks from other sectors should also be investigated separately.

1.10: Organization of the research report

The report of the research work is divided into seven chapters with the first Chapter providing an introduction consisting of a brief description of corporate securities' investments, review of literature, importance and objectives of the study, hypothesis used and methodology adopted. A discussion on the different approaches to investment valuation, procedure followed for the formulation of the base hypothesis and a theoretical framework on accounting ratios and its use in company analysis is provided in Chapter 2. Chapter 3 to chapter 6 is devoted to the discussion of the analysis and the results obtained. When Chapter 3 discusses the empirical validity of the causal relations between macroeconomic performance and stock returns in India, Chapter 4 explains the divergence in the market performance of indices representing equity securities of different industrial sectors in India and its causes. It also gives some glimpses of Indian IT industry and its structure and competitiveness. Chapter 5 and Chapter 6 are completely devoted to the discussion of firm level performance and stock returns. While Chapter 5 gives descriptions on the financial performance of selected IT firms in India, Chapter 6 provides empirical validity on the use of Price Earnings ratio in making successful stock investments in India. Finally the last chapter, Chapter 7 is set apart for the summary of findings and conclusions of the study.

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Chapter 2

INVESTMENT DECISION APPROACHES IN STOCK MARKET– AN EXPLORATION

2.1: Investment decision-Different approaches

Investors in stock market are interested primarily in selling securities for more than they paid for it, including the receipt of dividend during the period security is held. The investors hope to achieve a higher reward than they would have been possible by placing the amount of money in a bank deposit or a bond investment.

Identifying the forces that drive stock prices is a major concern for both practical investor and academicians. Stock prices are determined by a host of factors ranging from rational and fundamental factors to irrational psychosomatic factors. So the behavior of stock prices is studied with the help of different methods or approaches. These approaches can be grouped in to two diametrically opposed approaches as Fundamental and Technical analysis.

2.1.1: Fundamental analysis

Fundamental analysis generally refers to the study of the economic factors underlying the price movement of securities, not the price movements themselves. For the most part, this form of analysis usually results in longer-term investments and is considered to be a more conservative approach. At the basic level fundamental approach is concerned with the company that underlies the stock itself. They evaluate the company's past financial performance as well as credibility of its accounts. This approach attempts to determine whether the company is financially sound and will continue to earn money. When performing a fundamental analysis of the stock of interest, one tries to determine whether the stock is worth to invest or not. He uses earnings and dividend prospects of the firm, expectations of interest rates, and risk evaluation of the firm to determine proper stock prices. Ultimately it represents an attempt to determine the intrinsic value of a share which is equal to the present discounted value of all the payments a stockholder will receive from each share. This value is opposed to the value at which it is being traded in the market place. If the intrinsic value is more than the current share price, the analysis of the investor shows that the real worth of the stock is more than its current market price and that it makes sense to buy the stock. At this level, normally one looks at how well the company is performing financially. What are the company's earnings? Have they been growing? How does the ratio of the price of the stock versus the earnings per share, the P/E ratio, compare with other similar companies?

At a higher level, fundamentalists attempt to quantify the current value of a stock by gathering data relating to general industry outlook, overall market conditions, corporate financial strength, historical patterns of sales, earnings, market share, dividends, etc. More precisely the price or intrinsic value of a common stock shall be determined on the basis of certain basic economic factors or economic fundamentals. This is because the real value of a stock is always equal to

the discounted value of its future cash flows in the form of earnings and dividend. These cash flows vary along with the changes in macro economic performance of the country, the state of the industry and also with the specific performance of the firms issuing shares. So the fundamental analysis covers a detailed examination of the underlying forces which affect the well being of the economy, industry group and companies. As with most analysis, the goal is to derive a forecast, thereby make a profit from future price movements. At the firm level, company analysis may involve examination of financial data, management, business concept and competition. At the industry level there must be examination of supply demand forces for the products offered. For the national economy fundamental analysis might focus on economic data to assess the present and future growth of the economy. To forecast future stock prices, the analysis combines this economic, industry and company analysis to derive a stock's current fair value and then try to assign a future value to the stock by analyst's interpretation and projection. The fundamental approach also holds the view that the market price and intrinsic value of stock can differ for some time, but they would eventually tend to be equal. The difference between the current and future values reflects the fundamentalist's assessment of the stock's potential as an investment opportunity.

Much of the work of the fundamentalist involves accurately projecting earnings going forward and the factors affecting earnings. In theory, the fundamentalist who can make accurate projections and who chooses quality securities when they are under-valued and sells them when they are over-valued can reap substantial profits. Of course, when these assessments are faulty the result is a tendency to maintain a losing position longer than necessary.

2.1.2: Technical analysis

Technical approach is solely concerned with how the price of the stock has performed overtime and attempted to predict what it will do in the future based on this. Technical analysts (followers of technical analysis) do not consider any of the

company's fundamentals for their stock selection. They seek to determine the future price of a stock solely based on the potential trends of past price (a time series form analysis). Technical analysts test historical data to establish specific rules for buying and selling securities with the objective of maximizing profit and minimizing risk of loss. In other words, technical approach is concerned primarily with price action and trying to identify patterns that repeat themselves.

Along with the historical price data, technical analysts look at current price data to see if there is any established pattern applicable and if so, extrapolations can be made to predict the future price movements. For identifying the past trend in share price data, the technical analysts mainly use certain charts and chart patterns, hence the technical analysts are also known as chartists. These charts and chart patterns are used by the analysts for detecting the short term price movements. So the technical approach is often viewed as a short term investment/ speculation strategy. In addition to past price data, technical analysis also considers other statistics such as volume of trading and stock market indices mainly for capturing the general trend prevailing in the market.

Technical analysis is based on two main premises. First, the market's behavior patterns do not change much over time, particularly the long term trends. The patterns in market prices are assumed to recur in the future and thus these patterns can be used for predictive purposes. The key premise of the technical trader is that past price behavior can be used to forecast future price behavior.

The mathematics behind most technical analysis is much more complex and frequently requires much more of judgment demand on the part of the investor. However, the computer revolution made increased use of technically based trading in financial markets across the globe. With the help of computers one can easily discern price tendencies or patterns that would have been difficult or impossible to identify by hand. Proponents cite several other advantages of technical trading too. For one, it eliminates the onerous task of understanding the various fundamentals

of all the markets one might wish to trade. Technically based trading systems also can provide more objective buy/sell decisions, as long as the trader or researcher avoids interjecting his own subjective analysis into his computer output. However, interpreting a chart or an indicator is, at least in part, a subjective issue.

Investing in stock is much more likely to be successful if a systematic approach is used. Both approaches have their strengths and knowledge of both will benefit any investor and result in improved investment returns. However the price of the stock in the short term is not important in fundamental analysis, since the theory is that if the company is earning money and continues to earn money, then the stock price will eventually go up.

2.2: Efficient Market Hypothesis and Random walk theory

In predicting the stock market movement, two theories have had significant impact on market research – Efficient market hypothesis (EMH) and Random walk theory. Both EMH and random walk theory have discouraged predicting stock's future prices.

2.2.1: Efficient Market Hypothesis

Chicago finance Professor Eugene Fama in his 1970 paper 'Efficient Capital Markets' coined the term EMH and made it operational with the foundational epithet that in efficient markets, 'prices fully reflect all available information'. In EMH the price of a security is a reflection of complete market information. Whenever a change in financial outlook occurs, the market will instantly adjust the security price to reflect the new information. This means that given the information, no prediction of future change in the price can be made. This is also highly controversial and often disputed theory. Supporters of this model believe it is pointless to search for undervalued stocks or try to predict trends in the market through fundamental analysis and technical analysis. EMH contained three

different levels of information sharing: the weak form, the semi strong and the strong form.

Within weak EMH, only historical information is embedded in the current price. So excess returns cannot be earned in the long run using investment strategies based on the historical share prices or other historical data. Technical analysis will not be able to consistently produce excess returns, though some forms of fundamental analysis may still provide excess returns. Share prices exhibit no serial dependencies, meaning that there are no "patterns" to asset prices. This implies that future price movements are determined entirely by information not contained in the price series.

The semi strong form goes a further step further by incorporating all historical and currently public information in to the price. In this form of market efficiency, it is believed that share prices adjust to publicly available new information very rapidly and in an unbiased fashion, such that no excess returns can be earned by trading on that information. Semi-strong-form efficiency implies that neither fundamental analysis nor technical analysis techniques will be able to reliably produce excess returns.

The strong form of Market Efficiency theory holds the view that the current price reflects all the information available. Since all possible information is already reflected in the price, investors and traders will not be able to find or exploit inefficiencies based on fundamental information. The strong form includes historical and current public information as well as private information such as insider information in the share price. Therefore, no one can have advantage on the market in predicting prices since there is no data that would provide additional value to the investors. But the strong form market efficiency is surely false (Fama 1991).

2.2.2: Random walk theory

A random walk is one in which future steps or directions cannot be predicted on the basis of past actions. When we apply the random walk in stock market, we can say that it is a theory which states that the past movement or direction of the price of a stock or overall market cannot be used to predict its future movement. In other words, a random walk is one in which future steps or directions cannot be predicted on the basis of past actions. Originally examined by Maurice Kendall (1953), the theory states that stock price fluctuations are independent of each other and have the same probability distribution, but that over a period of time, prices maintain an upward trend. In short, random walk says that stocks take a random and unpredictable path. The chance of a stock's future price going up is the same as it going down. The investors cannot beat the stock market because news travels too rapidly. When a new bit of information emerges, investors react to it almost instantly, bidding a stock's price up or down until it reaches a new equilibrium. Therefore, the only things that the market hasn't taken into account are things that haven't happened yet. Those events are, by definition, random. Malkiel (1973), states that both technical analysis and fundamental analysis are largely a waste of time and unproven in outperforming the markets. But Lo and MacKinlay (1988) shows that the people who devote enough time, money, and brainpower can beat the market by finding undervalued companies. In other words, they argued that the share prices are predictable and excess returns can be earned by following fundamental approach to stock valuation.

2.3: Formulation of base hypothesis

At the outset of the study for formulating the base hypothesis of the research, an exploratory sample study based on share prices of 52 companies belonging to different industries over the period from 1st April 2000 to 31st March 2010 were made. Stocks completed ten years of listing in NSE and included in Nifty or Nifty Junior Index have constituted the sample for this purpose.

According to Efficient market hypothesis of Eugine Fama (1970), stock prices by and large extent to follow a random walk. More specifically, stock prices tend to change in a random fashion with an upward drift over time. The EMH relies on the efficient use of information by investors and is often referred to as "informational efficiency". If the stock market is proved relatively inefficient it signals the possibility of abnormal returns to the selected investors of the market. One group known as 'Technical analysts' argue that this is possible simply by looking for patterns in stock prices during the past, then assess the present position and make a decision accordingly. Another group, known by the name, 'Fundamentalists' strongly believe that the fundamentals of overall economy, industry and of companies issuing stocks shall decide fortune to the investors in future.

2.3.1: Testing random walk behaviour of long run stock returns in India

In order to explore whether there exists any chance for equity investors to earn abnormal returns from their investments in Indian stock market, random walk behavior of stock returns needed to be tested at first. This has been done through two distinct processes.

2.3.1. a: *Random expectation of stock returns – Binomial distribution model*

Initially a simple test of random walk is conducted by examining the annual growth in stock prices. This test is a model of the test conducted by Brealy (1983) for studying the successive changes in corporate earnings. Under this test the stocks are grouped according to the number of years in which their growth rate of price (returns) in a particular year was above the average rate of growth in prices of all 52 stocks in that year. From Table 2.1 it can be noted that no stock was above average in 5 or more years.. Most of the stocks received above average growth in

prices only in 2 or 3 years. Only two stocks have got growth which was below average in all 10 years

Table 2.1

Number of companies experiencing a given number of years of above average annual growth in their stock prices

Years	Actual no. of Companies	Expected no. of Companies
0	2	0
1	6	1
2	18	2
3	17	6
4	9	11
5	0	12
6	0	11
7	0	6
8	0	2
9	0	1
10	0	0
Chi square value - 103.20		**P value – 0.000**

The third column of Table 2.1 lists the number of companies one would expect to observe in each group if stock return was distributed by random chance among companies. If growth in prices was distributed randomly, then for a sample of 52 companies one would expect to find one stock with only one year of above average growth, 2 stocks with only two years of above average growth and at the other end of the spectrum, 2 stocks with eight years of above average growth and one stock with nine years of above average growth – all simply due to random chance. The expected frequencies of the sample distribution were estimated by fitting a binomial distribution model. Then actual results were compared with expected results and the difference between the two is tested with Chi-square for

determining the behaviour of growth in stock prices. But test results found significant difference between the actual and expected which repudiate the validity of the hypothesis of stock market efficiency and random movement of stock prices in Indian context.

2.3.1. b: Run test

Using run test the study considered whether or not years of above or below average growth tended to bunch up for individual stocks. The number of runs for all the stocks in the sample is determined and reported in the second and third column of Table 2.2.

Table 2.2

Runs of successive years with growth greater or less than average

Length of run(years)	Actual No. of runs of good years	Actual No. of runs of bad years	Expected No. of runs of good years
1	94	47	37
2	5	21	24
3	5	24	10
4	1	22	3
5	0	17	1
6	0	2	0
7	0	0	0
8	0	0	0
9	0	1	0
10	0	1	0
Chi square value - 107.60		**P value – 0.000**	

The mean length of the run for 52 stocks studied found too small. 94 runs of good (+ runs) years and 47 runs of bad years (- runs), 5 runs of good years and 21 runs of bad years, 5 runs of good years and 24 runs of bad years and 1 run of good years and 22 runs of bad years having run length of 1, 2, 3 and 4 years respectively were observed by the study. Zero runs of good years and 17 runs of bad years were seen for run having length of 5 years. Poisson distribution model was applied (as the mean length of the runs is too small and distribution is discrete) for expecting the number of runs of good years having a finite run length which are reported in column 4 of the Table 2.2. Then the actual runs are compared with the results one would expect if stock price changes are distributed in a random fashion. Again classical statistical tests applied here do not prove that stock prices in India change in a random fashion in the long run.

Irrelevance of random walk hypothesis in Indian context justifies the possibility of making abnormal returns by the investors of the stock market. But here again one more question arises: How it is possible to them- whether by studying the past price changes as technician suggests or through a top down method of analysis of a stock. If the theory of 'past price changes shall affect the further price movement in the stock market' fails it automatically accept the argument of fundamentalist – 'price movement of a stock in the market is subject to the influence of earning prospects of the issuer firm.

2.3.2: Auto Correlation Function – Test of independence of price changes overtime

If we can forecast the price of a stock by looking at its prices in previous periods, then changes in stock prices over time will be correlated. Table 2.3 dealt with autocorrelation of growth in stock prices of selected companies.

Auto Correlation Function (ACF) measures the amount of linear dependence between observations in a time series that are separated by lag k. Autocorrelation of growth in stock prices refers to the relationship between the current growth in price of stock of a particular company and its own growth in previous years. If the price changes of the stocks are independently distributed, its Auto correlation will be zero for all time lags. An autocorrelation of lag 1 refers to the stock price changes in adjacent years. An autocorrelation coefficient of lag 2 refers to the correlation coefficient of the stock price change in a particular year with the price change 2 years before. An important issue here is the choice of lag length. A rule of thumb is to compute Auto Correlation Function (ACF) up to one-third to one-quarter the length of the time series (Damodar.N. Gujarati p.812). So the study has chosen lag length 4.

Table 2.3 and Table 2.4 report the autocorrelation coefficients of price changes in Nifty and Junior Nifty stocks respectively. Analysis shows that the autocorrelation for lags of 1 to 4 years are very low in almost all cases. In many of the cases value of the coefficients are less than 0.25. The most extreme correlation was almost 0.50 and there were only four companies (Asian paints, BPCL, National and Unitech) in the group having this range of correlation at lag 1. If it is think of in terms of regressing stock price changes in year 't' against stock price changes in year 't-1', the R^2 would be only 0.25. Thus knowing the change in previous year's stock prices one can explain only 25 per cent of the change in the current year stock prices and this was for the most extreme autocorrelation.

Table 2.3: Autocorrelation coefficients of Annual stock price changes (Nifty stocks)

Autocorrelation for stock prices

Companies	Lag 1			Lag 2			Lag 3			Lag 4		
	ACF	Q	Prob.	ACF	Q	Prob.	ACF	Q	Prob.	ACF	Q	Prob.
ABB	-0.10	0.13	0.722	0.38	2.34	0.31	-0.34	4.34	0.227	-0.20	5.11	0.277
ACC	-0.08	0.08	0.777	0.35	1.95	0.377	-0.55	7.19	0.066	-0.07	7.30	0.121
BHEL	-0.29	1.15	0.283	0.52	5.16	0.076	-0.39	7.78	0.051	-0.09	7.95	0.093
BPCL	-0.50	4.22	**0.042**	0.52	8.23	**0.022**	-0.31	9.89	**0.019**	0.255	11.19	**0.025**
CIPLA	-0.29	1.09	0.296	0.14	1.40	0.497	-0.52	6.11	0.107	0.06	6.17	0.187
GAIL	-0.43	2.64	0.104	0.38	4.81	0.09	-0.46	8.38	0.039	0.14	8.76	0.067
GRASIM	-0.24	0.75	0.386	0.15	1.09	0.584	-0.44	4.44	0.217	0.24	5.59	0.231
HCLTECH	0.25	0.82	0.364	0.14	1.14	0.567	-0.65	8.32	0.04	-0.31	10.23	0.057
HDFC	-0.29	1.09	0.295	0.32	2.63	0.269	-0.14	2.95	0.399	-0.10	3.16	0.532
HERO HONDA	-0.29	1.10	0.295	0.32	2.63	0.269	-0.14	2.95	0.399	-0.10	3.16	0.532
ICICI	-0.07	0.07	0.787	-0.09	0.20	0.903	-0.07	0.29	0.962	0.07	0.39	0.983
INFOSYSTCH	-0.22	0.62	0.433	-0.11	0.81	0.666	-0.06	0.88	0.831	-0.04	0.90	0.924
LT	-0.14	0.26	0.612	0.32	1.78	0.411	-0.54	6.73	0.081	-0.02	6.74	0.152
M&M	-0.17	0.37	0.543	0.17	0.82	0.662	-0.37	3.12	0.373	-0.10	3.34	0.503
NATIONALUM	-0.56	6.26	**0.012**	0.50	10.33	**0.006**	-0.50	15.1	**0.002**	0.51	21.51	**0.000**
ONGC	-0.35	1.65	0.199	0.50	5.44	0.066	-0.39	8.03	0.045	0.05	8.09	0.088
RANBAXI	-0.15	0.30	0.582	0.26	1.32	0.518	-0.11	1.48	0.687	-0.02	1.48	0.829
RAYMONDS	0.15	0.28	0.594	-0.01	0.28	0.868	-0.23	1.20	0.753	-0.23	2.27	0.686
RELCAPITAL	-0.28	1.06	0.304	-0.01	1.06	0.590	-0.34	3.03	0.387	0.22	4.02	0.403
RELIANCE	-0.15	0.30	0.584	-0.34	2.05	0.358	-0.13	2.36	0.502	0.33	4.50	0.343
SAIL	0.24	0.76	0.384	-0.26	1.73	0.421	-0.32	3.48	0.323	-0.08	3.60	0.463
SBI	-0.34	1.54	0.215	0.26	2.56	0.279	-0.37	4.91	0.179	0.19	5.66	0.226
SEIMENS	0.01	.01	0.981	0.31	1.49	0.478	-0.52	6.11	0.106	-0.24	7.28	0.122
SUNPHARMA	-0.29	1.11	0.292	-0.14	1.41	0.495	0.18	1.93	0.587	-0.14	2.31	0.68
TATAPOWER	-0.41	3.49	0.061	0.17	3.92	0.141	-0.21	4.67	0.208	0.23	5.76	0.218
UNITECH	0.46	2.83	0.093	-0.23	3.61	0.165	-0.33	5.46	0.141	-0.22	6.42	0.171
WIPRO	-0.21	0.58	0.446	0.09	0.71	0.701	-0.34	2.66	0.447	-0.14	3.05	0.550

Note: Bold figures indicate statistically significant Autocorrelations.

Table 2.3: Autocorrelation coefficients of Annual stock price changes (Nifty Junior stocks)

Autocorrelation for stock prices

Companies	Lag											
	1			2			3			4		
	ACF	Q	Prob.	ACF	Q	Prob.	ACF	Q	Prob.	ACF	Q	Prob.
APPOLLO	-0.31	1.30	0.255	0.05	1.34	0.512	-0.11	1.56	0.669	0.24	2.70	0.61
ASHOKLEY	-0.33	1.46	0.227	0.48	4.90	0.086	-0.48	8.78	0.032	0.25	10.04	0.06
ASIANPAINT	-0.46	2.79	0.095	0.34	4.47	0.107	-0.48	8.42	0.038	0.12	8.70	0.069
BANKBARODA	-0.02	0.00	0.951	-0.25	0.91	0.633	-0.17	1.38	0.71	-0.00	1.38	0.847
BEL	-0.27	1.00	0.318	0.51	5.22	0.074	-0.39	7.84	0.049	0.15	8.30	0.081
BHARATFORG	0.37	1.86	0.172	0.05	1.90	0.387	-0.43	5.00	0.172	-0.25	6.26	0.18
BOI	-0.15	0.29	0.591	-0.22	1.00	0.605	0.14	1.32	0.724	-0.21	2.20	0.699
CHENNPETRO	-0.09	0.11	0.742	-0.13	0.33	0.847	-0.22	1.11	0.775	0.04	1.142	0.888
CONCOR	-0.31	1.27	0.261	0.29	2.54	0.281	-0.21	3.27	0.352	-0.24	4.44	0.351
CORPBANK	0.00	0.00	0.996	0.07	0.07	0.965	-0.05	0.12	0.99	-0.12	0.39	0.983
DRREDDY	0.03	0.01	0.906	-0.18	0.51	0.776	-0.31	2.05	0.562	-0.09	2.21	0.697
GLAXO	-0.07	0.07	0.794	0.27	1.14	0.567	-0.27	2.42	0.494	-0.38	5.24	0.264
GLENMARK	0.15	0.29	0.588	-0.08	0.43	0.819	0.09	0.55	0.908	-0.57	7.09	0.131
HPCL	-0.25	0.80	0.372	0.20	1.39	0.499	-0.31	2.96	0.399	-0.21	3.81	0.433
IFCI	-0.04	0.02	0.89	-0.33	1.61	0.447	0.30	3.19	0.363	-0.12	3.50	0.479
INDHOTEL	0.26	0.903	0.342	0.094	1.035	0.596	-0.38	3.53	0.317	-0.515	8.831	0.065
IOB	0.13	0.19	0.657	-0.11	0.35	0.842	-0.31	1.93	0.586	-0.01	1.93	0.748
LICHSGFIN	-0.36	1.75	0.1986	0.09	1.86	0.396	-0.17	2.35	0.504	0.02	2.35	0.671
MOSERBAER	-0.21	0.54	0.463	0.01	0.54	0.763	-0.12	0.77	0.856	0.34	3.13	0.537
MRPL	-0.18	0.45	0.504	-0.15	0.80	0.671	-0.26	1.95	0.583	0.17	2.54	0.637
SESAGOA	0.13	0.22	0.640	-0.13	0.47	0.791	-0.24	1.46	0.692	-0.26	2.79	0.593
SYNDIBANK	0.195	0.506	0.477	0.23	1.29	0.524	-0.42	4.25	0.235	-0.38	7.16	0.128
VIJAYA BANK	0.09	0.09	0.765	-0.18	0.55	0.765	-0.29	1.95	0.584	0.02	1.95	0.744
WOCHART	-0.00	0.00	0.987	0.29	1.22	0.544	-0.31	2.84	0.418	-0.29	4.48	0.345
WIPRO	-0.21	0.58	0.446	0.09	0.71	0.701	-0.34	2.66	0.447	-0.14	3.05	0.550

Note: Bold figures indicate statistically significant Autocorrelations.

Then for testing the significance of autocorrelation coefficient of stock price changes over the period the Ljung–Box Q-statistic is also used in this study. It is a type of statistical test of whether any of a group of autocorrelations of a time series is different from zero. Instead of testing randomness at each distinct lag, it tests the "overall" randomness based on a number of lags, and is therefore a portmanteau test. The high sample autocorrelations lead to large values of Q. If the calculated value of Q exceeds the appropriate Chi – square values in a table, we can reject the null hypothesis of no significant autocorrelations.

From the analysis we can see that the values of Q test accept the joint null hypothesis of zero autocorrelations for the full period in all the companies except that of BPCL and National. When ACFs are found significant at all lags in both companies, Q test rejects the joint null hypothesis of zero autocorrelations at one per cent level in National and at five per cent level in BPCL.

Thus this exploratory sample study found lack of autocorrelation in growth of stock prices in the long run which appears that forecasts of future return from stock investments based on simply extrapolating the historical stock prices are unlikely to be much of value. Here arguments of technician would be rejected. While the historical price data is not providing a convenient point of departure, then the average forecasts will have to be based on the analysis of a large variety of economic variables- among these there would be economic environment the firm is expected to operate in, the profile of the industry it belongs to and its expected competitive position, operating efficiency, dividend policy after all quality of management. Since most of these information components are available only quarter or annual basis (except economic variables which is monthly available), the investors has to frame their investment plans on a long term perspective for deriving benefits under this approach. In sum, we can reach a hypothesis that fundamental approach to valuation of shares can produce better returns to long term equity investors in India.

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Chapter 3

ECONOMIC ENVIRONMENT ANALYSIS

3.1: Introduction

The stock market is an integral part of the overall economy of a country especially that of an emerging economy likes India. It plays an important role in the economy by mobilizing domestic resources and channeling them to productive investment. Price of a stock may be defined as discounted value of its future cash flows. For an investor or security analyst cash flows means dividend and earnings which is expected to accrue from his stock investments. So the stock returns should be affected by any factor that influences future cash flows or the discount rate of cash flows

(Chen, Roll and Ross 1986). Cash flows of the firms move according to the real economic activity. The movement of stock prices is highly sensitive to changes in fundamentals of the economy and to the changes in expectations about future prospects. If the economy grows rapidly, the industry is also expected to show rapid growth reflecting the prosperous outlook for its sales and earnings which would result in increased cash flows and stock prices. An outlook sagging economic growth can lead to lower corporate profits, a prospect that can endanger investor pessimism and lower stock prices. Similarly if the economy is recovering and booming, when the corporate turnaround is in progress, the corporate revival will be faster and stronger. On the other hand, if the economy is in the grip of severe recession when the corporate turnaround is launched, the entire recovery process will slow down. So the analysis of macroeconomic environment is very important in order to understand the earning prospects of companies and to study the behavior of the prices of their stocks traded in a market.

One can relate the stock markets of a country with the performance of its economy in many ways. A significant amount of literature now available examines the relationship between stock market returns and the macroeconomic environment over a number of stock markets and time period. On consolidating these literatures we can find that two general views exist among the scholars and practitioners with regard to such relationship. The first relationship views that the changes in stock market cause fluctuations in macroeconomic environment of a country and the second

perceives that the stock market development and changes are the result of economic conditions of the country. In other words the former case implies that stock market leads economic activity, whereas the latter suggests that it lags economic activity and which is more important for a security analyst.

3.2: Performance of Indian economy: An overview

India is an emerging economy which has witnessed unprecedented levels of economic expansion, alongside China, Russia, Mexico and Brazil. India is a cost effective labour intensive economy, and has benefitted immensely from outsourcing of work from developed countries and has a strong manufacturing and export oriented industrial/service framework.

The Indian economy is one of the attractive destinations for business and investment opportunities due to huge manpower base, diversified natural resources and strong macroeconomic fundamentals. Also the process of economic reforms initiated since 1991 has been providing an investor friendly environment though a liberalized framework spanning the whole economy. India has transverse a long way since then and is now widely recognized as one of the fastest growing countries in the world. Table 3.1 gives some glimpses of the performance of Indian economy during the period 2000-01 to 2009-10:

Table 3.1

Performance of Indian Economy during the period 2000-01 to 2009-10

Financial Year	GDP at Factor cost (%)	Index of Industrial Production	WPI inflation (%)	Forex Reserves in USD billion	Exchange rate (Rs Vs $)	Money supply (M₃) in Rs. billion	Repo rate(%)	Fiscal deficit (in billion)	FII Net flows (in Crore)
2000-01	4.40	162.6	7.2	42.28	46.78	13132.20	9.00	1188.16	184.7
2001-02	5.80	167.0	3.6	54.11	48.91	14983.55	8.00	1409.55	150.5
2002-03	3.80	176.6	3.4	76.10	47.37	17179.60	7.00	1450.72	37.7
2003-04	8.50	189.0	5.5	112.96	43.93	20056.76	6.00	1232.72	1091.8
2004-05	7.50	204.8	6.5	141.51	43.74	22539.38	6.00	1252.02	868.6
2005-06	9.50	221.5	5.4	151.60	44.61	27295.45	6.50	1464.35	992.6
2006-07	9.70	247.1	4.7	199.20	41.29	33102.78	7.75	1425.73	322.5
2007-08	9.20	268.0	8.3	309.70	39.97	40178.82	7.75	1269.12	2032.8
2008-09	6.70	275.4	10.2	252.00	50.95	47914.81	5.00	3265.15	-1501.7
2009-10	7.40	275.7	11.5	279.10	45.14	55997.62	5.00	3328.35	2094.8

Source: RBI Handbook on Indian economy, Economic Survey reports various issues, CSO

Indian economy showed robust growth during the last ten years of the study. High growth rates in industry and service sectors and a benign world economic environment provided a backdrop conducive to the Indian economy. Until the global financial crisis showed its head in mid-2007, the Indian economy was witnessing a break in its growth and had moved to a range of above 9 per cent, supported by strong domestic consumption, investment and export demand. Then after a spell of long growth it has experienced a slump in 2008. It showed down turn to 6.8 per cent in 2008-09, but achieved more than 7 per cent growth in 2009-10. The economy has expanded on an average 8.5 per cent between 2003-04 and 2009-10. The industrial upturn, from the beginning of the study peaked by the end of 2006-07 and has moderated from 2007-08. From the close examination of the trend persisting in these growth indicators of the economy it is implied that India has not faced any recession so far, but experienced only an economic deceleration during the last two years. However Indian policymakers should rely on well-tested homegrown policies in taking the country to the higher and sustained growth path.

During the first seven years of the study period Wholesale Price Inflation (WPI) in India was within the tolerance band of 5-7 per cent. Softening trend in inflation was found until the FY ended 31st March 2003, increased subsequently to 6.5 per cent by end March 2005 before reached its comfort zone of below 5 per cent in 2006-07. Thereafter it remained always at elevated level (ie at two digit level, way above the desired level of about 3 -5 per cent), by and large has been on an upward trajectory partly reflecting supply-side pressures on key agricultural commodities such as rice, wheat, oilseeds/edible oils, increase in iron and steel prices in line with

international prices, partial pass-through of international crude oil prices to domestic prices and continued demand pressures.

Interest rate was on upward trend during the period 2003-04 to 2007-08. The repo rate was increased from 6.00 per cent to 7.75 per cent during this period. This could be taken as part of the Reserve Bank of India's continued effort to take pre-emptive monetary actions in a calibrated manner in line with the evolving monetary and liquidity conditions for containing inflation and inflationary expectations in the country. But monetary management during 2008-09 (reduction of repo rate to 5 per cent) had to contend with challenges of high inflation in the first half and the high speed and magnitude of the external shocks and its spillover effect through the real, financial and confidence channels in the second half. Policy measures at this time were aimed at providing ample rupee liquidity, ensuring comfortable foreign exchange liquidity and maintaining a market environment conducive for the continued flow of credit at viable rates to production sectors of the economy. The expansionary money supply justifies its impact on the real economic activities in the country.

On the external sector front, although India's current account deficit has been widening, its robust macroeconomic fundamentals have also facilitated some capital inflows in to the country. But during the periods of heightened global uncertainty (2008-09), panic were seen among the Foreign Institutional investors, on account of which huge amount of capital was out flowed from the country. The reduction in capital flows may have made monetary management easier, but the reduction is so sharp that the rupee is coming under heavy pressure, having dipped below Rs 50 to the dollar, even as RBI's foreign exchange reserves have fallen by $57.70

billion during that year. Fiscal pressures were seen which have led international credit agencies to consider downgrading India's credit rating from investment to speculative grade. But the recovery of the market from short term obscurity in 2009-10 has reinstated the investor confidence and regained the previous momentum slightly at an increasing scale, in the capital inflows from Foreign Investors to the country, which could be viewed as an outcome of diminishing returns from other investment destinations of the globe and the potential of the Indian economy to grow further.

Finances of the Government are under some stress, especially during the last two years, on account of several factors such as increased pressures from oil, fertilizers and food subsidies, the farm loan waiver scheme and the hike in wages following the implementation of the Sixth Pay Commission recommendations.

3.3: Capital market reforms in India

3.3.1: Reforms (1991-2000)

The liberalization and globalization measures initiated in India during the 1990s have brought in drastic changes in the structure and working of her stock market. In fact it fuelled the growth of equity cult in India. Trading was through open outcry and settlement and transactions were paper based till then. Regulations were not effective and disclosure norms by companies were inadequate. The security scam of Harshadh Metha (June 1992) revealed inadequacy of and inefficiencies in the financial system, which prompted a radical change of Indian stock market. The Parliamentary Committee headed by M.J Pherwani which probed into the scam recommended a vigilant regulatory body in order to reform and

regulate the market. Consequently, SEBI which had formed in 1988 as a non-statutory body (an advisory body) was endowed with statutory powers through the enactment of SEBI Act, 1992. Since then, the Indian stock market witnessed a sea change in terms of technology and market practices.

Technology made radical change in the trading mechanism in India. The Over the Counter Exchange of India (OTCEI) set up in 1992 with an intention to provide an alternate market for the securities of smaller companies which could not fulfill the minimum capital requirement for listing. It is the first decentralized and transparent market in India. National Stock Exchange (NSE) was set up in 1994 with tight disclosure norms and electronic trading was established. The screen based trading introduced has made the price discovery process more efficient. The National Securities Clearing Corporation (NSCC) was established in April 1995 for having improved clearing and settlement mechanism in the market. The Depository Act 1996 paved the way for setting depositories for trading in dematerialized form. National Securities Depository Ltd. (NSDL) and Central Depository Services Ltd. (CDSL) were set up in November 1996 and July 1999 respectively for facilitating the dematerialized trading which virtually eliminate the risks of bad deliveries involved in securities trading. Takeover Code (1996) was drafted in the country to regulate the activities connected with corporate takeovers and acquisitions due to the changing corporate scenario in new economic regime. In-depth review of the mutual fund regulations led to a new set of regulations known as SEBI (Mutual Fund) Regulations, 1996 which brought about restructuring of mutual fund industry and laid down norms for the structure of management of mutual funds by defining required relationship between the fund sponsor, trustees, custodian, and AMC. Also, as per this notification Foreign Institutional

Investors (FIIs) registered with SEBI were permitted to invest in domestic mutual funds.

Rolling settlement was introduced in January 1998 (T+5 day basis) by replacing the age-old permanent settlement mechanism for helping traders to settle their accounts quickly without waiting for a fixed settlement date. Buy back of shares were permitted in 1998 which enabled the companies to purchase back of its shares from the shareholders by using their reserves. The companies later cancel these shares, which reduce its equity capital and increase Earnings per Share. This in turn sends a positive signal in the market and the company's share price rises.

3.3.2: Reforms (2000-2010)

Liberalization of the insurance sector for the purpose of opening it to private Indian business houses as well as international players was made in 2000. IRDA bill, which permit this was approved by the Indian cabinet in December 1999. Since then domestic and International private players have been entering in to Indian Insurance Industry. Internet trading was permitted in February 2000 for providing wider market access for investors. In order to improve the liquidity and efficiency of the market the definition of securities was expanded to include derivatives. Trading on index futures (June 2000) and options (June 2001) were started at first and then stock futures (July 2001) and stock options (November 2001) were commenced to trade in the stock market. The Government decision to privatize PSUs in 2000 fuelled stock prices. Ketan Parekh security scam of 2001 led to the abolition of badla system in July 2001 and rolling settlement made compulsory for all stocks in January 2002. The rolling settlement cycle was reduced from T+5 to T+2. Since the difference between trade date and

settlement date is small, the systematic risk could be reduced by this reform. Disinvestment of major public sector units in India (For eg: VSNL in 2002) fuelled the stock prices.

For providing liquidity to market and also for including the excluded group of small investors in the stock market operations many measures were initiated in Indian stock market. The 'lot trading system' was given up and the investors were allowed to buy stocks in odd lot quantities, even in one or two share basis. Similarly, the directions from SEBI persuade the companies to split shares of their larger denominations in to smaller denominations which again provide opportunity to small investors to participate in stock market investment with their tiny savings. Both of the measures also provide liquidity to market by enhancing the investor base in the country.

The Indian capital market went global with permission for companies to issue Global Depository Receipts (GDR) traded largely in Europe and American Depository Receipts (ADRs) traded on the US market. Foreign institutional investors have emerged as the largest and dominant players in the Indian bourses especially after 2005. NSE has gained an upper hand over its rival BSE in terms of volumes not only in equity market but in the case of derivative market also. With an intention to end the broker's control over stock exchanges in India, Securities Contract Regulation Act 1956 was amended by the Government in 2006 through the promulgation of an ordinance making the corporatization and demutualization of stock exchanges mandatory. The amendment not only requires separation of ownership and trading right, but also requires that the majority ownership rests with the public and those without any trading right. Currency futures were permitted to trade in NSE and BSE in 2007 which provides an

alternative investment avenue to market investors. By taking into account the preference of investors in Gold as an investment medium trading in Gold Exchange Traded Fund (ETF) was started in 2008.

Bygone years were a long journey for the Indian capital market. Now, the capital market is well organized, fairly integrated, matured, more global and highly modernized. When we analyze these developments of Indian capital market in two different time periods, we can see that the first phase reforms were given more thrust to the modernization of trading and settlement mechanism of the market. But the second phase of reforms has been focusing on the governance and financial innovation facilitating wider investment options and protective measures to investors in Indian stock market. Indian capital market is one of the best in the world in terms of technology up gradation. Internet trading has become common and it is getting integrated with global markets. In terms of governance and financial innovation also the Indian market is able to meet the international level standards. These developments have increased the participation of Foreign Institutional Investors and other institutional investors in Indian stock market, thereby widening the investor base and increasing the volume of business.

3.4: Performance of Indian stock market (NSE) during the period 2000-2010

Table 3.2 gives summary statistics on the performance of Indian stock market during the ten year period of the study. Indian stock market, in terms of return has performed very well during the post reform period. In most of the years it was able to produce positive returns to its investors. It is surprising to note that every alternate year from 2003-04, the market has delivered terrific returns and its return profile during those years is

abnormally higher than that of just previous years. Highest market growth (85.11 per cent) was observed in 2003-04 which could be attributed to the overall IT boom in the world economy. Since then, the stock market of the country was able to produce return for investors and the same trend continued until 2008-09. But the year 2008-09 brought in relentless distress to the investors by causing a loss of more than one-third of the value of their wealth which they would have hold at the beginning of the year. But the financial year 2009-10 again saw the market delivering amazing returns (71.51 per cent) which enable the investors to earn twice of their capital which they lost in the previous year (on considering it in relative terms).

Table 3.2

Indian Stock market performance – Descriptive statistics

Year	Monthly return (%)			Annual return (%)	Risk (S.D)	Skewness
	Minimum	**Maximum**	**Average**			
2000-01	-16.2	10.84	-2.06	-24.54	9.26	-0.11
2001-02	-13.16	9.22	0.19	0.76	6.33	-0.34
2002-03	-10.41	12.24	-1.03	-12.47	6.30	0.67
2003-04	-7.49	15.36	5.50	85.11	7.49	-0.32
2004-05	-14.65	9.14	1.28	14.22	6.60	-1.10
2005-06	-9.25	13.08	4.62	67.38	6.70	-1.19
2006-07	-17.84	9.14	0.66	11.99	7.56	-1.50
2007-08	-13.46	15.73	2.58	31.59	8.73	-0.04
2008-09	-22.96	14.42	-2.80	-35.51	12.84	0.13
2009-10	-10.22	23.97	5.04	71.53	10.15	0.44

Compiled from NSE price data

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positive returns to its investors. It is surprisinng to note that every alternate year from 2003-04 the market has delivered terrific returns and its return profile during those years is abnormally higher than that of just previous years. Highest market growth (85.11 per cent) was observed in 2003-04 which could be attributed to the overall IT boom in the world economy. Since then, the stock market of the country was able to produce return for investors and the same trend continued until 2008-09. But the year 2008-09 brought in relentless distress to the investors by causing a loss of more than one-third of the value of their wealth which they would have hold at the beginning of the year. But the financial year 2009-10 again saw the market delivering amazing returns (71.51 per cent) which enable the investors to earn twice of their capital which they lost in the previous year (on considering it in relative terms).

When we look into the risk profile of Indian stock market, it can be seen that return variability has been increasing year by year especially from 2004-05 onwards. In 2008-09, when Indian market tumbled down due to the Global financial tsunami, market volatility reached its extreme high of 12.84 per cent. During the subsequent year of recovery also, risk per cent was at double digit level, however slightly less than its previous year. The persisting trend in stock market volatility of the country confirms the observation of market critics that India is one of the riskiest emerging markets of this world.

. It can also be seen that frequency distribution of monthly stock returns in India were not normal during most part of the study period. In fact, during mid years of the study (2004-05 to 2006-07) it showed extreme form of skewness as its coefficients were excess of unity. Skewness

coefficient in 2007-08 almost equals to zero which in one way help to say that market is relatively normal during the year. It is also interesting to note that 6 out of 10 year study period the distribution of stock returns in India exhibited medium to high degree of negative asymmetry indicating the greater possibility of large decreases in prices there rather than rises, which could be a real concern to investors.

On considering the overall performance of Indian stock market, we can say that the size of the returns that could be produced by it for the investors is significantly much higher than the losses made by it during the period of observation. Existence of such a wide gap between gains and losses gives the indication that investors can maximize their wealth by parking their savings in the stock market of the country on a long term perceptive even though at a relatively higher level of risk.

3.5: Stock market and its linkage with the macroeconomic environment – Theories and Empirical evidences

As suggested by Chen, Roll and Ross (1986), the selection of relevant macroeconomic variables requires judgment which should draw upon both on existing theory and existing empirical evidence. The following paragraphs briefly discuss the existing theory and empirical findings on the stock market movement and its linkage with macroeconomic environment of a country.

Theory suggests, as many authors find, that corporate cash flows are related to a measure of aggregate output such as GDP or industrial production. The levels of real economic activity will likely influence the stock prices in the same direction, through its impact on corporate profitability: an increase in output may increase expected future cash and,

hence, raise stock prices, while the opposite effect would be valid in a recession. Chen, Roll and Ross (1986), Mukherjee and Naka (1995), Wongbangpo and Sharma (2002) and Majid and Yousof (2009), all of these researchers and their studies have found significant positive association between stock prices and economic activities in various countries.

The changes in the direction of monetary policy are expected to have essential effect on the stock market. The interest rates in the organized financial sector of the economy are determined by the monetary policy of the government and trend in money supply .These rates are thus controlled and varied within certain ranges. For instance, restrictive policies via higher interest rates or discount rates would make cash flows worthless after being discounted. This would reduce the attractiveness of investment, hence, shrinks the value of stock returns. From the substitution effect hypothesis, a raise in the rate of interest increases the opportunity cost of holding cash, which later on leads to a substitution effect between stocks and other interest bearing securities like bonds. In summary, both the restrictive policy and the substitution effect hypothesis suggest that interest rate should be inversely related to stock return. In his study, Shahid Ahamad (2008) observed such inverse relationship between stock returns and interest rate movement. Frequently, researchers on financial economics have included both a long term interest rate and a short term interest rate. Changes in the short rate are mainly driven by the business cycle and monetary policy. In contrast, the long term interest rate should indicate the longer term view of the economy concerning the discount rate.

Another important variable concerning monetary policy is money supply. Many experts have seen the relation between money supply and stock prices even though they failed to bring the consensus regarding the

direction of relationship. When consolidating their findings it can be seen that the money supply likely to influence share prices through at least three mechanisms: First, a change in the money supply is related to unanticipated increase in inflation and future inflation uncertainty and hence negatively related to the share prices (Geske and Roll 1983, Pearce 1985); Second, changes in the money supply may positively influence the share price through its impact on economic activity (Mukherjee and Naka 1995). A change in the money supply provides information on money demand, which is caused by future output expectations. If the money supply increases, it means that money demand is increasing, which in effect, signals an increase in economic activity. Higher economic activity implies higher cash flows, which causes stock prices to rise. Finally, portfolio theory suggests a positive relationship, since it relates an increase in the money supply to a portfolio shift from non-interest bearing money to financial assets including equities (Fama and French 1993).

Beside interest rate and money supply the inflation can also cause the movement of stock prices. Unanticipated inflation may directly influence real stock prices (negatively) through unexpected changes in the price level. Inflation uncertainty may also affect the discount rate thus reducing the present value of future corporate cash flows. DeFina (1991) argued that rising inflation initially has a negative effect on corporate income due to immediate rising costs and slowly adjusting output prices, reducing profits and therefore the share price. Empirical studies by Barrows and Naka (1994) and Chen et.al (2005) reveal that inflation has negative impact on stock market.

According to 'Good market approaches' (Dornbusch and Fischer, 1980), changes in exchange rates affect the competitiveness of a firm as

fluctuations in exchange rate affects the value of he earnings, and cost of its funds in many companies borrow in foreign currencies to fund their operations and hence its stock price. An alternative explanation for the relation between exchange rates and stock prices can be provided through portfolio balance approaches that stress the role of capital account transactions. Like all commodities, exchange rates are determined by market mechanism, i.e., the demand and supply condition. A blooming stock market would attract capital flows from foreign investors, which may cause an increase in the demand for a country's currency. The reverse would happen in case of falling stock prices where the investors would try to sell their stocks to avoid further losses and would convert their money in to foreign currency to move out of the country. There would be demand for foreign currency in exchange of local currency and it would lead depreciation of local currency. As a result, rising (declining) stock prices would lead to an appreciation (depreciation) in exchange rates. Ma and Kao (1990) and Abdulla Murinde (1997) provided empirical evidences on the inverse relationship between exchange rate and stock returns.

Apart from other macro economic consequences, stock market investments in emerging economies like India are directly affected by the Foreign Institutional Inflows. The foreign investments in domestic equities of these countries have been increasing overtime due to the international diversification strategies pursued by the foreign investors in their effort to minimize the risks and maximize the returns from their portfolios. There are studies (Chakrabarti 2001, Griffin et al. 2004) which reveal that it is the Foreign Portfolio investments that move the stock in emerging economies and these capital flows could be regarded as the major source of growth and development of the market there. But some other research in this area

(Agarwal 1997, Trivedi and Nair 2003) argues that FII inflows are not a cause, but an effect of equity returns from the domestic markets. The high rates of growth coupled with an increasing trend in corporate responsibility have imparted buoyancy to the stock markets, triggering of return chasing behavior by the FIIs. But some others (Babu and Prabheesh 2007) agree on bidirectional causality between stock market performance and FII inflows to India. Furthermore, movements in stock prices may influence exchange rates and money demand because investors' wealth and liquidity demand could depend upon the performance of the stock market.

Literature reveals differential levels of cause – effect relationship between key macroeconomic variables and stock prices. This relationship varies in different stock markets across the globe. Studies relate to the Indian stock market and its linkage with the economy have produced contradicting results which might be due to the difference in time horizons covered under study or due to the divergence in techniques employed. Since the post financial liberalization era we can see a completed trading cycle in Indian stock market by encompassing all of its phases and a study covering such a period definitely can produce more robust results. Moreover, this study is employing more than one technique, looking for the causality between Indian economy and the performance of its stock market indicating both degree and its direction.

3.6: Data frame and the variables

As it would be almost impossible to incorporate every potential aspect to explain the stock market behavior, the researcher limits this study to selected macroeconomic variable which were identified through literature review and intuitive financial theory. The study has employed NSE

benchmark Index - CNX S&P Nifty to proxy for Indian stock market. Industrial production index in India is compiling and publishing on monthly basis, hence it is used instead of GDP to give proxy for the domestic supply factors/national output. To gauge the money stock in the economy the most popularly used Broad Money Supply (M3) and to give proxy for interest rate prevailing in the economy 3 months's Treasury Bill (TB) rate have been used in this study. To account for inflation, the Whole Sale Price Index and to check the linkage with the external world, Rs/$ exchange rate is used. To recheck the validity of some of the earlier studies finding that Foreign Institutional Investors is the crucial factor deciding the stock price behavior in India, FII net flows to India has also included in the data frame. Data selection takes into account the data availability and their accessibility within the available timeframe. The monthly data ranged from April 2000 which symbolises the beginning of financial liberalizations in India and spans to as far as March 2010. Required data were mainly obtained from RBI handbook on statistics and Economic Survey reports (various issues) published by Government of India.

3.7: Hypothesis and Empirical methodology

The study hypothesizes a relationship between the stock return and six macroeconomic variables – money supply (M3), exchange rate, TB interest rate, WPI, IIP and FII net flows - which were identified on the basis of available literature.

3.8: Non-stationary time series (Unit Root)

Time series analysis must fulfill the stationary property of data series for drawing useful inferences. Broadly speaking a data series is said to be

stationary if its mean and variance are constant (non-changing) overtime and the value of co variance between time periods depends only on the distance or lag between two time periods and not on the actual time at which the covariance is computed. Estimation using non-stationary data will lead to unreliable t-statistics, as the underlying time series would theoretically have infinite variances. So at first stationarity of the time series variables is tested by performing unit root test. The study has followed the standard procedure of unit root testing by employing the Augmented Dicky Fuller (ADF) test. Since ADF test is often criticized by low power, this test is also complimented with Phillips Perron (PP) test. Both ADF and PP tests on the variables in levels and first differences to check for stationarity or unit roots.

3.8.1: Augmented Dickey Fuller (ADF) Test

ADF is a parametric method for controlling higher order correlation by assuming that the series follows an AR (p) process. This process is done by adding lagged difference terms of the dependent variable to the right-hand side of the regression. The Augmented Dickey-Fuller test requires running a regression of the first difference of the series against the series lagged once, lagged difference terms and a constant with a time trend such as:

$$\Delta Y_t = \alpha_0 + \beta_0 t + \lambda Y_{t-1} + \gamma_i \sum_{i=1}^{m} \Delta Y_{t-1} + u_t ------(1)$$

Where Δ is the first difference operator, u_t is an error term, and m is the number of lagged first differenced term and is determined such that u_t is approaching white noise. The H_o hypothesize that Y_t is non stationary time series (has a unit root) translates in to H_o:λ= 0. The output of the ADF test

consists of the t (tau) statistic on estimated coefficient of the lagged variable (λ) and the critical values for the test of a zero coefficient. If the estimated ADF statistic is larger (in absolute) than its critical value then the null is rejected suggesting that the series is a stationary. The choice of optimal lag lengths used in the unit root tests is determined by applying Akaike (AIC) and Schwarz (SC) information criteria.

3.8.2: Phillips-Perron (PP) Test

Phillips and Perron (1988) proposed a nonparametric method for controlling higher-order serial correlation in a series. Like ADF PP test is a test of the hypothesis ρ =1 in the following equation.

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \rho Y_{t-1} + u_t \;------(2)$$

While the ADF test corrects for higher order serial correlation by adding lagged differenced terms on the right-hand side, the PP test makes a correction to the t-statistic ρ, which is corrected for serial correlation in u_t. The correction is nonparametric. The advantage of Phillips-Perron test is that it is free from parametric errors and allows the disturbances to be weakly dependent and heterogeneously distributed.

3.9: Modeling causality between stock prices and macro economic variables

The Vector Auto Regression (VAR) by Sims (1980) has been estimated to capture short run causality between stock prices and key macro economic variables. VAR is an extension of uni- variate auto regression model. This technique is commonly used for forecasting system of interrelated time-series and for analyzing the dynamic impact of random

disturbances on the system of variables. The VAR model allows for characterization of dynamic interaction between variables, without any restrictions on the structure of the system. VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all of the endogenous variables in the system. All seven variables used in this study are considered as endogenous variables for VAR models with assumptions that all these variables are interrelated. It is assumed that constant is the only exogenous variable in the system. In the present study, multivariate VAR model taking Log Nifty as endogenous variable has been specified in first differences as given in equation 3

$$\Delta LNFT_t = \alpha + \sum_{i=1}^{k} \beta_{1i} \Delta LNFT_{t-i} + \sum_{i=1}^{k} \beta_{2i} \Delta TBR_{t-i} + \sum_{i=1}^{k} \beta_{3i} \Delta WPI_{t-i} + \sum_{i=1}^{k} \beta_{4i} FII_{t-i}$$

$$+ \sum_{i=1}^{k} \beta_{5i} IIP_{t-i} + \sum_{i=1}^{k} \beta_{6i} \Delta M_{3t-i} + \sum_{i=1}^{k} \beta_{7i} \Delta EXT_{t-i} + e_{1t} \text{ --------- (3)}$$

Where, ΔLNFT – Log value of monthly relative change in NSE Nifty

ΔTBR – Monthly relative change in 3 months Treasury bill rate

ΔWPI– Monthly relative change in Wholesale Price Index

FII -   Monthly Foreign Institutional Investment net flows to India

IIP -   Monthly relative change in Industrial Production in India

ΔM_3 – Monthly relative change in money supply (broad money)

ΔEXT – Monthly relative change in exchange rate (Rs vs $)

'α' and 'e_{it}' are constant and error terms respectively.

Similarly six more VAR equations (listed below) were framed, by taking each of the six macroeconomic variables as endogenous variables in each equation. This has been done for identifying the explanatory and forecasting power of the variables in the relational matrix.

$$\Delta EXT_t = \alpha + \sum_{i=1}^{k}\beta_{1i}\Delta LNFT_{t-i} + \sum_{i=1}^{k}\beta_{2i}\Delta TBR_{t-i} + \sum_{i=1}^{k}\beta_{3i}\Delta WPI_{t-i} + \sum_{i=1}^{k}\beta_{4i}FII_{t-i} +$$

$$\sum_{i=1}^{k}\beta_{5i}IIP_{t-i} + \sum_{i=1}^{k}\beta_{6i}\Delta M_{3t-i} + \sum_{i=1}^{k}\beta_{7i}\Delta EXT_{t-i} + e_{1t}$$

------------------ (4)

$$\Delta M_{3t} = \alpha + \sum_{i=1}^{k}\beta_{1i}\Delta LNFT_{t-i} + \sum_{i=1}^{k}\beta_{2i}\Delta TBR_{t-i} + \sum_{i=1}^{k}\beta_{3i}\Delta WPI_{t-i} + \sum_{i=1}^{k}\beta_{4i}FII_{t-i} +$$

$$\sum_{i=1}^{k}\beta_{5i}IIP_{t-i} + \sum_{i=1}^{k}\beta_{6i}\Delta M_{3t-i} + \sum_{i=1}^{k}\beta_{7i}\Delta EXT_{t-i} + e_{1t}$$

------------------ (5)

$$\Delta WPI_{3t} = \alpha + \sum_{i=1}^{k}\beta_{1i}\Delta LNFT_{t-i} + \sum_{i=1}^{k}\beta_{2i}\Delta TBR_{t-i} + \sum_{i=1}^{k}\beta_{3i}\Delta WPI_{t-i} + \sum_{i=1}^{k}\beta_{4i}FII_{t-i} +$$

$$\sum_{i=1}^{k}\beta_{5i}IIP_{t-i} + \sum_{i=1}^{k}\beta_{6i}\Delta M_{3t-i} + \sum_{i=1}^{k}\beta_{7i}\Delta EXT_{t-i} + e_{1t}$$

---------------- (6)

$$\Delta TBR_{3t} = \alpha + \sum_{i=1}^{k}\beta_{1i}\Delta LNFT_{t-i} + \sum_{i=1}^{k}\beta_{2i}\Delta TBR_{t-i} + \sum_{i=1}^{k}\beta_{3i}\Delta WPI_{t-i} + \sum_{i=1}^{k}\beta_{4i}FII_{t-i} +$$

$$\sum_{i=1}^{k}\beta_{5i}IIP_{t-i} + \sum_{i=1}^{k}\beta_{6i}\Delta M_{3t-i} + \sum_{i=1}^{k}\beta_{7i}\Delta EXT_{t-i} + e_{1t}$$

-------------------- (7)

$$FII_t = \alpha + \sum_{i=1}^{k}\beta_{1i}\Delta LNFT_{t-i} + \sum_{i=1}^{k}\beta_{2i}\Delta TBR_{t-i} + \sum_{i=1}^{k}\beta_{3i}\Delta WPI_{t-i} + \sum_{i=1}^{k}\beta_{4i}FII_{t-i} +$$

$$\sum_{i=1}^{k}\beta_{5i}IIP_{t-i} + \sum_{i=1}^{k}\beta_{6i}\Delta M_{3t-i} + \sum_{i=1}^{k}\beta_{7i}\Delta EXT_{t-i} + e_{1t}$$

-------------------- (8)

$$IIP_t = \alpha + \sum_{i=1}^{k} \beta_{1i} \Delta LNFT_{t-i} + \sum_{i=1}^{k} \beta_{2i} \Delta TBR_{t-i} + \sum_{i=1}^{k} \beta_{3i} \Delta WPI_{t-i} + \sum_{i=1}^{k} \beta_{4i} FII_{t-i} +$$

$$\sum_{i=1}^{k} \beta_{5i} IIP_{t-i} + \sum_{i=1}^{k} \beta_{6i} \Delta M3_{t-i} + \sum_{i=1}^{k} \beta_{7i} \Delta EXT_{t-i} + e_{1t}$$

------------------ (9)

With in the framework of this VAR system of equations, the significance of all the lags of each of the individual variables is examined jointly with an F test. Since several lags of the variables are included in each of the equations of the system, the coefficients on individual lags may not appear significant for all lags, and may have signs and degrees of significance that vary with the lag length. However F tests will be able to establish whether all of the lags of a particular variable are jointly significant.

3.10: Impulse Response Function and Variable Decomposition in VAR analysis

The F tests and an examination of causality in a VAR will suggest which of the variables in the model have statistically significant impacts on the future values of each of the variables in the system. But it will not be able to explain the sign of the relationship or how long it would take for the effect of that variable to work through the system. Such information will, however, be given by an examination of the VAR, s impulse responses and variance decompositions

The IRF traces out the response of the dependent variable in the VAR system to shocks in the error terms. If the error term in each VAR equation increases by a value of one standard deviation, such a shock or change makes a change in the endogenous variable in the current as well as future periods. The IRF traces out the impact of such shocks for several periods in the future. IRF is considered as the centerpiece of VAR analysis.

Variance decomposition is the alternative way which separates the variation in endogenous variable in to the component shocks to VAR. Thus the variance decomposition which provides information about the relative importance of each random innovation in affecting the variables in the VAR has also been presented. In econometric literature, both Impulse recourse functions and Variance decomposition together are known as innovation accounting (Enders 1995).

3.11: Empirical results

3.11.1: Unit root test results

In order to check for the presence of random behavior of the series the study has used two prominent unit root tests – ADF and PP tests. The test procedure incorporates the presence of both trend and intercept in each series.

Table 3.3

Test results for Stationarity of variables

Variables	Level(with trend and intercept)		First Difference (with trend and intercept)	
	ADF	PP	ADF	PP
Nifty	-0.3918	-0.5912	-11.1095*	-11.1812*
Exchange rate	-3.5654	-2.3177	-7.7107*	-7.7660*
M_3	-1.1784	-1.5228	-8.2355*	-10.9627*
WPI	-3.1060	-2.1818	-6.2743*	-7.0374*
TBR	-1.6911	-1.8112	-11.1105*	-11.1225*
IIP	-1.2688	-6.0065*	-1.1759	-28.5741*
FII	-8.8248*	-9.3701*	-9.8567*	-78.7474*

*Significant at one per cent level H_0: Variable has a unit root

Table 3.3 summarizes the results of ADF and PP unit root tests. On the basis of ADF test statistics, all the series except Foreign Institutional Investment net flows are found to be non stationary at levels with intercept and linear trend. But PP test rejects the null hypothesis of unit root at the

level itself in series of both FII and IIP (at one per cent level of significance) with intercept and linear trend. On considering the relative merit of PP test over ADF test (automatic correction to the DF procedure to allow for auto correlated residuals) it is reasonable to believe that the variable IIP also is integrated order 0, hence I(0) variable. But the remaining five variables (exchange rate, TBR, WPI, M3 and Nifty are integrated of order one as they become stationary with intercept and trend at one per cent level of significance after their first differencing.

3.11.2: Causality between Stock returns and economic variables – VAR results

To explore the existence of causality between the stock market and the macroeconomic variables as hypothesized in the study The Vector Auto Regression (VAR) by Sims (1980) has been estimated. The primary step of the analysis is the determination of optimum lag with the system of Vector Auto Regression. The Akaike's information criteria (AIC) and Schwarz criteria (SC) have been employed to determine the appropriate number of lags and the optimum lag length based on these criteria is 3 for the model.

Table 3.4 exhibits coefficients of the exogenous variables in each equation and the F values of lagged terms up to three lags in the VAR system. The null hypothesis that macro economic variables do not jointly cause NSE Nifty is rejected at one per cent level of significance. Similar inference is drawn in the case of other simultaneous equations in the VAR system. In general the signs of all variables are in line with the theoretical predictions. In particular money supply, exchange rate, Interest rate and FII inflows cause stock market movement in India.

The result shows that the relationship between NSE Nifty and macro economic variables is statistically significant in the case of four variables only – interest rate, exchange rate, money supply (all these at 5 per cent level) and FII inflows which is at 10 per cent level.

Table 3.4
Stock returns and macroeconomic variables – VAR results

	ΔEXT	ΔLNFT	ΔM₃	ΔTBR	ΔWPI	IIP	FII
Constant	-6.894351	0.083116	2239145.	-3.367237	5.209481	-66.67671	25518.66
	[-1.97109]	[1.34942]	[2.15045]	[-1.34858]	[0.67761]	[-1.10283]	[0.85509]
ΔEXT -1	0.245168	-0.003933	83695.11	-0.016769	-0.107321	-0.415665	-1132.82
	[2.27738]	**[-1.96711]	*[2.61160]	[-0.21821]	[-0.45355]	[-0.22338]	[-1.23332]
ΔEXT -2	-0.097342	0.002900	-13613.55	-0.016171	-0.038373	-1.05771	715.6669
	[-0.87011]	[1.57963]	[-0.40877]	[-0.20249]	[-0.15605]	[-0.54697]	[0.74977]
ΔEXT -3	-0.134649	-0.001599	7377.848	0.031814	-0.143994	0.448930	-295.5886
	[-1.32797]	[-0.89561]	[0.24443]	[0.43953]	[-0.64610]	[0.25615]	[-0.34168]
ΔLNFT-1	1.860059	1.071315	2658370.	4.787451	-5.763425	182.6436	18235.53
	[0.28756]	[9.40510]	[1.38053]	[1.03679]	[-0.40537]	[1.63351]	[0.33041]
ΔLNFT-2	6.158525	-0.177644	-3406044	6.595699	23.77539	-104.0316	-31613.06
	[0.67445]	[-1.10477]	[-1.25302]	[1.01186]	[1.18460]	[-0.65911]	[-0.40577]
ΔLNFT-3	-4.066193	0.059221	-574183	-9.556426	-21.17815	-40.81167	-2017.695
	[-0.62202]	[0.51445]	[-0.29506]	**[-2.04787]	[-1.47393]	[-0.36118]	[-0.03618]
ΔM₃-1	-1.21E-06	1.21E-08	0.062738	-1.41E-07	1.73E-07	1.37E-06	0.010381
	[-3.59547]	**[2.03898]	[0.62724]	[-0.58704]	[0.23410]	[0.23550]	*[3.62113]
ΔM₃-2	2.02E-07	6.75E-09	0.059306	-1.70E-07	-2.35E-06	3.63E-06	0.003696
	[0.58371]	[1.10505]	[0.57440]	[-0.68498]	*[-3.07606]	[0.60579]	[1.24892]
ΔM₃-3	4.72E-07	-3.39E-09	-0.017595	-8.70E-07	1.00E-06	-3.92E-06	0.001405
	[1.36319]	[-0.55562]	[-0.17063]	*[-3.51825]	[1.31357]	[-0.65408]	[0.47551]
ΔTBR-1	-0.193135	0.003738	118293.5	-0.132688	0.451900	-0.643061	3430.592
	[-1.47413]	[1.62018]	*[3.03300]	[-1.41872]	[1.56924]	[-0.28395]	[3.06893]
ΔTBR-2	0.057016	0.002560	58754.30	0.002604	0.299523	-0.80032	737.1677
	[0.40768]	[1.03937]	[1.41122]	[0.02609]	[0.97436]	[-0.33106]	[0.61777]
ΔTBR-3	-0.035044	-0.004735	29135.06	-0.294158	0.330073	-1.294064	-1634.441
	[-0.26319]	**[-2.01958]	[0.73504]	[-3.09478]	[1.12782]	[-0.56226]	[-1.43870]
ΔWPI -1	0.005879	-0.000242	-34142.61	0.075169	0.396383	-1.951782	-355.1795
	[0.13436]	[-0.31362]	*[-2.62128]	*[2.40663]	[4.12162]	*[-2.58068]	[-0.95142]
ΔWPI -2	0.017502	-0.00036	-10236.86	0.058014	0.145674	0.611947	-88.21467
	[0.36227]	[-0.42260]	[-0.71181]	***[1.68223]	[1.37187]	[0.73282]	[-0.21401]
ΔWPI -3	-0.015757	0.000421	-16115.15	-0.028829	-0.24267	-0.344045	64.74955
	[-0.36101]	[0.54777]	[-1.24028]	[-0.92526]	[-2.52952]	[-0.45602]	[0.17387]
IIP(1)	-0.015134	-4.14E-05	-873.5617	-0.006395	-0.004849	0.251439	-64.74881
	*[-2.68683]	[-0.41773]	[-0.52098]	[-1.59042]	[-0.39170]	[2.58253]	[-1.34730]
IIP(2)	0.003714	-9.31E-06	2527.202	0.000564	-0.005764	0.452839	58.66012
	[0.65998]	[-0.09392]	[1.50862]	[0.14032]	[-0.46599]	[4.65555]	[1.22177]
IIP(3)	0.007055	0.000112	793.6048	0.003435	0.019477	0.264410	40.63775
	[1.16819]	[1.05365]	[0.44143]	[0.79671]	[1.46732]	[2.53293]	[0.78867]
FII(1)	-3.77E-05	-1.69E-07	-0.161605	-1.30E-06	1.89E-05	-9.42E-05	0.026970
	*[-2.63544]	[-0.67104]	[-0.03793]	[-0.12725]	[0.60098]	[-0.38093]	[0.22087]
FII(2)	-7.19E-06	4.63E-07	-0.482296	1.82E-05	5.69E-06	-0.000216	0.170540
	[-0.49974]	***[1.82913]	[-0.11261]	***[1.76729]	[0.18004]	[-0.86891]	[1.38924]
FII(-3)	-2.24E-05	2.11E-08	4.258765	7.26E-06	-1.23E-05	0.000509	0.168492
	[-1.71386]	[0.09174]	[1.09483]	[0.77842]	[-0.42828]	**[2.25566]	[1.51129]
Adj. R2	0.274373	0.982429	0.120331	0.211356	0.288873	0.961364	0.233531
F-statistic	3.286714	339.1421	1.827258	2.620756	3.456655	151.4809	2.842614

* significant at one per cent level   ** significant at five per cent level   *** significant at ten per cent level

Bi-directional causality has been observed between NSE Nifty and interest rate in India. Interest rate has showed inverse relationship with the stock price movement. For the last few years the interest rate in the country has been softened considerably by RBI which must have made favorable impact on Indian stock market for two reasons. Firstly, the lower interest rate means lower cost of capital and better corporate earnings, which should have made positive impact on share prices. Secondly, the lower interest rate in the fixed income segment has made the investors fonder of equity investments which definitely have provided a boost to the stock market. On the other side development in stock market in the country has helped corporate a lot to mobilize capital from domestic as well as international market easily, which in turn makes the debt market redundant one and such lack of demand for debt fund made it cheaper. These could be the reasons for two way causality between interest rate and stock returns in India.

There is direct casual link between money supply and NSE Nifty. As hypothesized the stock prices in India is positively related to the changes in the money supply (M3) of the country. An increase in the money supply leads to economic expansion through increased cash inflows and the stock prices is benefitted from the economic growth lead by such expansionary monetary policy. Money supply is also affecting the stock index movement through its effect on interest rate also.

Further, results reveal that exchange rate causes Nifty, while there is no causality from Nifty to exchange rate. Currency depreciation leads to more export earnings and higher capital inflows to the country thereby increased foreign exchange. More supply of foreign currency increases the money supply and expanding stock market.

There is only unidirectional causality from FII inflows to NSE Nifty. This could be the outcome of positive effect of FII inflows on expectations regarding the growth prospects of the stock market in the country.

In case of NSE Nifty to Index of Industrial Production there is no causality in either direction. Similarly inflationary conditions in the country do not cause stock index at any level, however it might have affected the stock price movement through its upshot on interest rate, thereby money supply in the market.

The VAR results also indicate that all the three monetary variables – money supply, inflation rate and interest rate are highly integrated as there exists bidirectional causality between them. More over linkage is also visible between financial sector and real sector variables. When money supply has its effect on FII inflows to India, the FII inflow leads Industrial production of the country which in turn has direct impact on exchange rate. Such effects on exchange rate causes money supply there by inflation also. From the linkages between the monetary variables and again its causality with the financial sector variables it can deduce that money supply is the prime economic variable which could make significant impact on stock return volatility in India. All these findings lead to a valid conclusion that any variable which has a negative effect on cash flows shall be in a negative relationship with the stock prices.

3.11.3: Impulse responses of NSE Nifty to innovation in Macroeconomic variables

Figure 3.1 to Figure 3.6 provides the impulse responses of stock returns in India for the one unit S.D innovation in macro economic variables of the country. The dotted lines represent a two standard band around the

estimates of impulse response. The effect can be significant if the band excludes zero. Considering the signs of the responses, innovations to exchange rate always have a negative impact on the stock prices and the effect of the shock does not die down, even after 10 months. A one standard deviation impulse in the Foreign Institutional Inflows innovation has a positive and significant effect on stock returns. But its effect is very short term and last only up to the 2nd month, beyond that the shock appears to have worked its way out of the system. With a positive innovation in money supply, the expansionary monetary shock, the response of stock prices is positive as expected. The effects start immediately and decline marginally after the fourth month. However its effects persist there for a long period. The Nifty response to its own shock is both significant and positive throughout the period. The innovations in other variables – Inflation and Index of Industrial found no significant effect on stock returns.
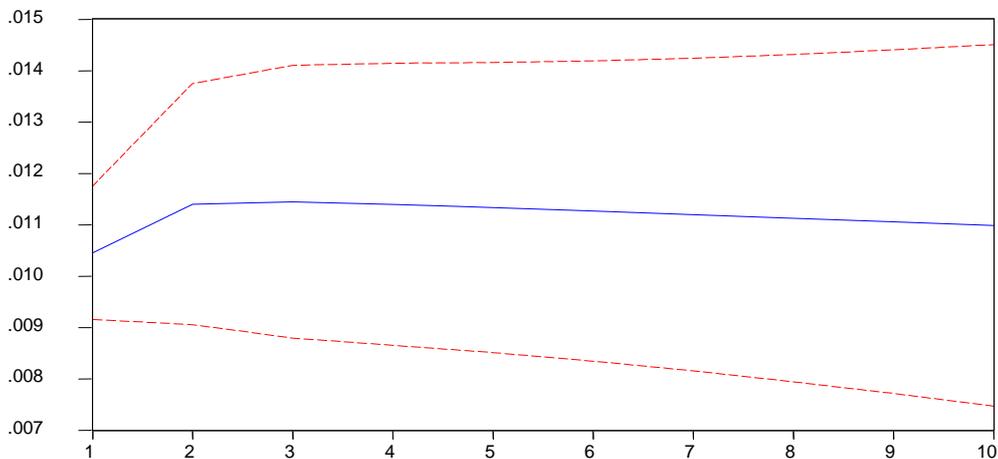
Figure 3.1: Impulse Response of NSE Nifty to Cholesky One

S.DNSE Nifty Innovation
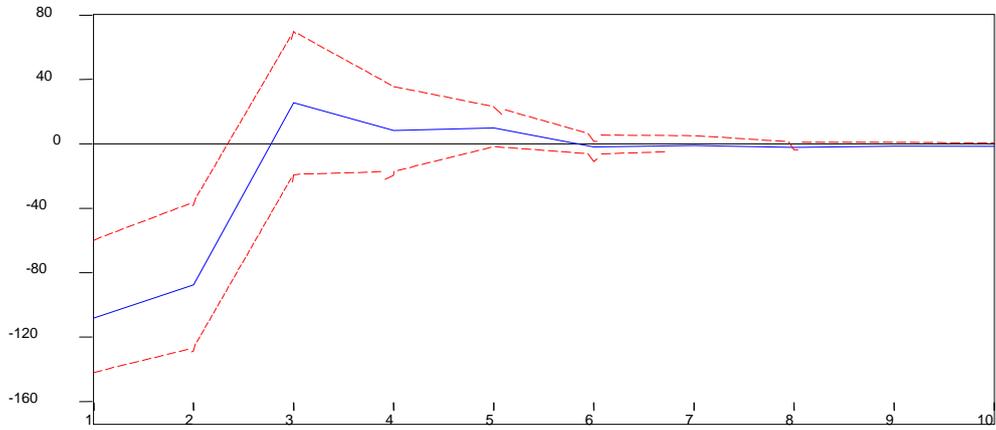
Figure 3.2:   Impulse Response of NSE Nifty to Cholesky One

S.D Exchange Rate Innovation
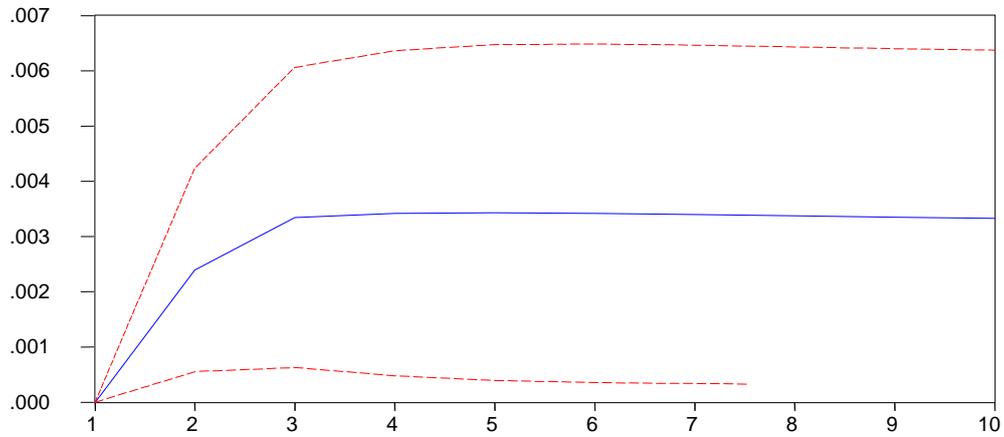
Figure 3.3:   Impulse Response of NSE Nifty to Cholesky One

S.D Money Supply Innovation
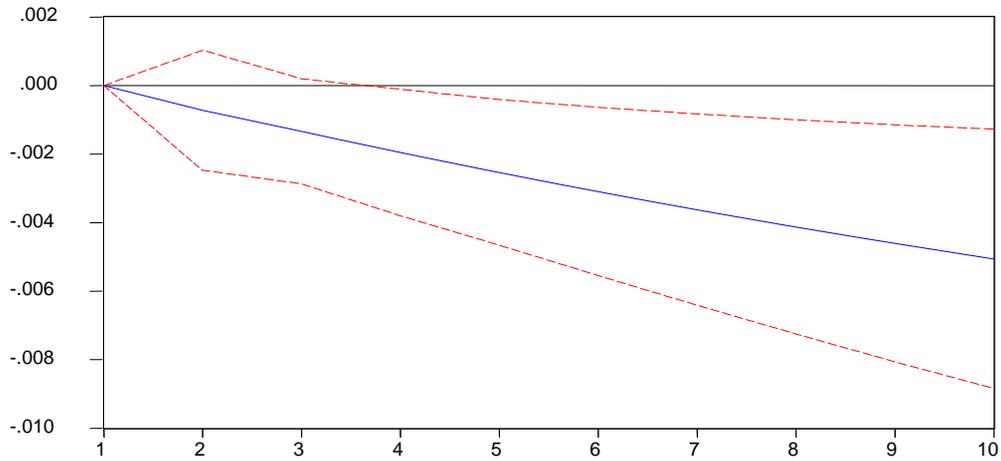
Figure 3.4: Impulse Response of NSE Nifty to Cholesky One S.D Interest Rate Innovation
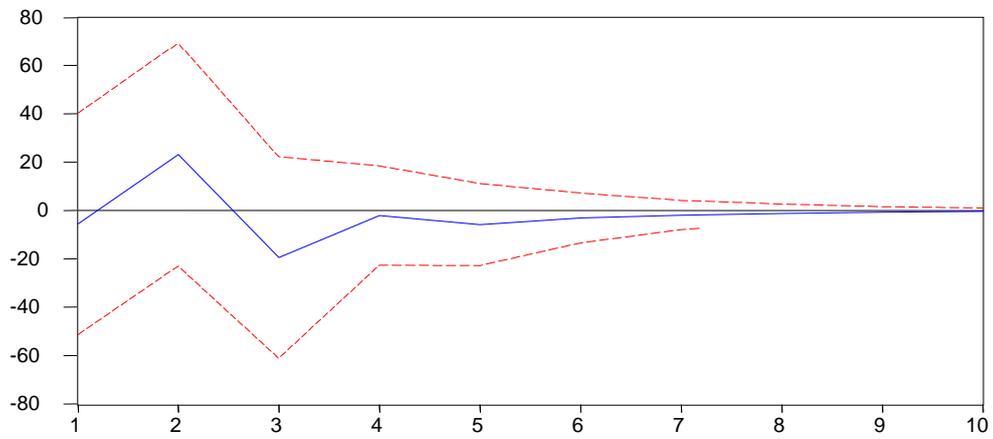
Figure 3.5: Impulse Response of NSE Nifty to Cholesky One S.D Wholesale Price Index Innovation
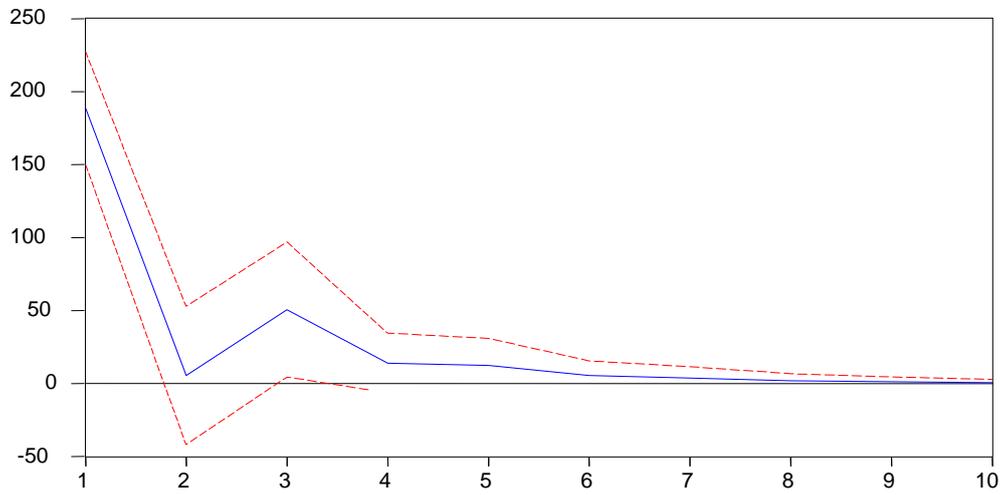
Figure 3.6:   Impulse Response of NSE Nifty to Cholesky One S.D FII Net Flow Innovation
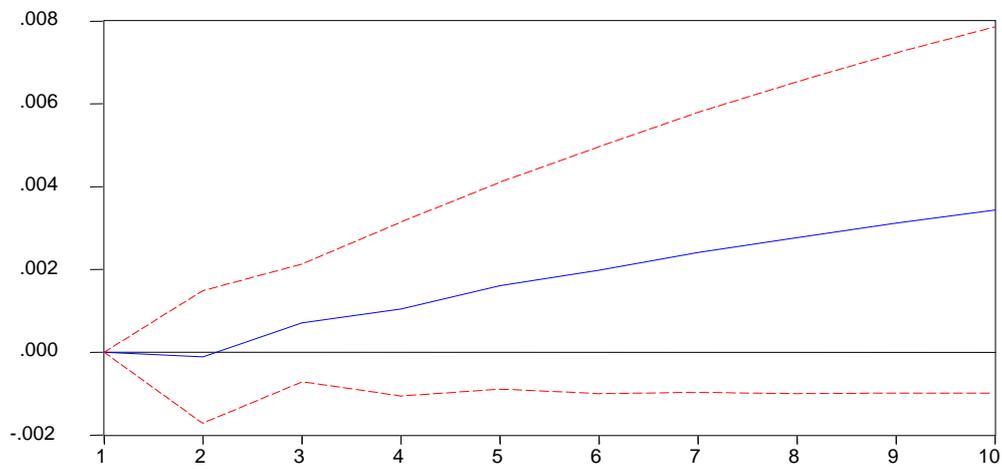
Figure 3.7:   Impulse Response of NSE Nifty to Cholesky One S.D IIP Innovation

Thus as indicated by the coefficients of variables in the frame work of Vector Auto regression system, similar causality is also observed graphically using impulse response function. So it shows the stability the VAR system in capturing the causality of the variables.

3.11.4 Variance decomposition of NSE Nifty

Finally the study has employed variance decomposition and impulse response function to further examine the dynamic interaction between Nifty and the selected macro economic variables. Taking the variables at level the study stimulates how they react to their own shocks and the shocks in other variables. The variables follow the Cholesky factorization. The variance decomposition results at the end of the 10 periods are shown in Table 3. The columns provide the percentage of the forecast variance due to each innovation in VAR system with each row adding up to 100.

Table 3.5

Variance decomposition of NSE Nifty

Period	NFT	EXT	FII	TBR	IIP	M_3	WPI
2	88.21059	2.256429	0.106641	1.484671	0.003356	7.914770	0.023544
3	80.73468	2.211762	0.288981	3.575139	1.043053	12.04941	0.096976
4	73.98080	2.202184	0.294278	5.247430	1.930216	15.66217	0.682916
5	68.47171	2.022792	0.276049	6.038532	3.356477	18.34158	1.492854
6	64.13169	1.833707	0.254827	6.302137	4.470155	20.43551	2.571976
7	60.44539	1.636392	0.227117	6.323346	5.414742	22.31814	3.634876
8	57.43833	1.463255	0.205341	6.239429	6.110177	23.98215	4.561320
9	54.90645	1.347027	0.187876	6.135628	6.627670	25.51425	5.281100
10	52.76776	1.317008	0.174387	6.038691	7.009419	26.90474	5.787993

From the analysis of Table 3.5 it is evident that NSE Nifty responds aptly to its own innovations, but the effects fade off over time. When NSE Nifty explained on an average 60 to 75 per cent of its forecast error variance, the other six macro economic variables together account for the remaining 25 to 35 per cent of the variation in NSE nifty series. Among these money supply has the strongest influence, which accounts for more than 20 per cent variation in Nifty index. More over it shows the increasing importance over time. Responses of exchange rate and interest rate are combatively better than that of other variables in the immediate future. But the importance of exchange rate is slowly absent after sometime. Even though the responses of Industrial production and inflation rate tend to be of slight importance/insignificant at the immediate lag, its effect is improving overtime. An interesting feature of the result is that the shocks by the FII do not cause any significant variation in the movement of the Nifty series.

The above analysis confirms the relationship between real economic variables and the stock market performance in India during its post financial liberalization period. The results suggest that monetary policy has a stronger and faster impact on both real and financial sectors in India including its stock market. In essence money supply, exchange rate and interest rate have significant impact on stock index. Even though the VAR analysis administered in the study has found statistically significant causality from FII net flows to NSE Nifty, the results of Impulse Response Function and Variance Decomposition tests failed to explain this finding. A few variables like inflation rate and Index of Industrial Production have shown very negligible influence on the stock market. In spite of these

inconsistencies in findings, on considering the dynamic interaction between the real economic variables with each other and its linkage with some of the financial sector variables it is rational to believe that the macro economic variables jointly cause stock market variations. But stock market cannot be characterized as leading indicator of economic activity, instead it lags economic activity. On account of this every investor in India must take these macroeconomic variables in to account for having better prediction of the future values of their stock investments. These results can be further examined by the policy makers in India while they are drafting the policies and guidelines governing the stock market in the country for achieving further development and growth in it.

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INDUSTRY ENVIRONMENT ANALYSIS

4.1: Introduction

Investing is the business of relative changes. When the economic outlook is assessed along with the direction of changes in the overall markets for the stocks, the analyst must realize that even though industry groups may find it difficult to 'buck the trend,' they do not necessarily respond to the same degree. Recessions or expansions in economic activity may translate in to falling or rising stock markets with different relative price changes among industry group. So in accordance with the recommended Economy – Industry - Company analysis (EIC analysis) sequence we now move on to the industry analysis.

The detailed work in the analysis of any corporate security logically begins with the industry. Most industries have important individual

characteristics that affect the values of their securities, and the analyst must review these carefully. The objective of this analysis is to assess the prospects of various industrial groupings. In fact, industry features are so important for a security analyst because the inherent nature of the industry itself shall sometimes decide the magnitude and patterns of cash flows in many of its member firms at different stages of the economy. Sometimes investment in stocks of worst firm in a growth industry may deliver better return than that the best firm in a declining industry delivers to its investors, hence an industry analyst demands insights in to the key factors that the influence the performance of particular sector and its relative strength or weakness compared to the other industrial groupings (Dougall and Corrigan 1978).

4.2: Importance of Industry analysis

Industry analysis is important for the same reason that the macro economic analysis is. Just as it is difficult for an industry to perform well when the macro economy is ailing, it is unusual for a firm in a troubled industry to perform well. Similarly just as we have seen that economic performance can vary widely across countries, performance of industry also can vary across industries.

The portion of economic theory which deals with the organization of industries (Chamberlin,1956, Joan Robinson,1933) suggests that firms which manufacture homogeneous products should maximize their profits by adopting fairly similar policies with respect to labor capital ratio, profit margins advertisement programmes etc. Each industry tends to have unique risk and return characteristics which result from the uniform technological process and similar set of operating policies that have been developed for

the production of its particular product. Economic competition between the firms in any given industry usually forces them all to adopt the most efficient production method, and this is the reason why all firms in a given industry tend to have similar return characteristics. Furthermore, the industry average rates of return differ significantly from industry to industry (Nerlove 1968). Fabozzi and Francis (1979) give empirical evidence that different investments result in different levels of risk which are the result of, among other things, significantly different levels of average risk from industry to industry. Such difference in risk level exists between the industries may be because of the different labor capital ratios, difference in their access to materials, differing degrees of foreign competition etc. Such differences between industries in terms their risk – return profile are what make the industry analysis worthwhile to perform.

4.3: Industry Factors

There are many factors pertaining to industries which investment analysts are likely to focus in their effort to appraise the investment profile of stocks belonging to a particular industry. Discussion of each of these features follows:

4.3.1: Sensitivity to the business cycles:

Industries are not equally sensitive to the business cycle changes. Some industries like FMCG, Pharmaceuticals etc. are virtually independent of the business cycle as the demand for the products of these sectors is regular in nature and hardly affected by the state of the macro economy and business conditions. But sectors like Real estate, Automobiles etc. are highly sensitive to the business cycle. Mainly three factors shall determine the sensitivity of an industry's earnings to the business cycle.

Sensitivity of sales is the prime factor determining the earnings efficiency of an industry at different stages in business cycles. The industries vary in their sensitivity to the business cycle. The sales of firms in industries that sell necessities such as food, drugs, and pharmaceutical products will show little sensitivity to business conditions. Consumer care, tobacco products and entertainment are industries with low sensitivity and for which income is not a crucial determinant of demand. In contrast, the firms in industries such as Machine tools, steel, auto and transportation are highly sensitive to the state of the economy (Bodie et al., 2000)

Second factor determining business cycle sensitivity is operating leverage which refers to the division between fixed and variable cost. Firms with greater amount of variable as opposed to fixed costs will be less sensitive to the business conditions. On the other hand firms with high fixed costs are said to have high operating leverage, as small savings in business conditions can have large impacts on profitability.

Third factor influencing business cycle sensitivity is financial leverages which is the use of borrowed capital in financing the fund requirements of firms. Interest on debt is to be paid regardless of the sales level. They are fixed cost that also increases the sensitivity of profit to business conditions.

4.3.2: Industry Life Cycles

Every industry is passing through different stages in its life cycle. Many industrial economics believe that the development of almost every industry may be analysed in terms of its life cycle. The life of an industry can be separated in to the pioneering stage, the expansion stage, the stagnation stage and decay stage. So the first step in industry analysis is to

determine what stage of growth through which the industry is passing at present. This approach will also be useful in analyzing the past and forecasting the future of an industry (Goodman 1970)

- *Pioneering stage*

   The early stages of an industry are often characterized by a new technology or product. In this beginning phase the product or industry starts with sales of zero and operates at a loss as initial sales obtained. Thereafter its demand not only grows but grows at an increasing rate. A great opportunity exists for profits and a large number of firms attempt to capture their share of the market, there arises a higher business mortality rate; many of the weaker firms attempting to survive in this new industry are eliminated, and a lesser number of firms survive this phase. A security analyst will have a difficult task at this stage selecting those firms that will on top for some time to come. Even if the analyst can recognize an emerging industry in the pioneering stage, he will probably not invest at this point in the industry's development because of the great risks involved and because of the tremendous difficulty in selecting the survivors.

- *Expansion Stage*

   The expansion stage is characterized by the appearance of the firms surviving from the pioneering stage. Sales of these companies grow rapidly and consistent annual profits usually begin to emerge during this stage. Their competition in the expansion stage brings about improved products at a lower price. These firms continue to expand but at a moderate rate of growth than that experienced in the pioneering stage. These now stronger, steadier, more efficient firms become more attractive for investment purposes. However these firms reinvest much of their earnings paying small

rate of dividend and also borrow heavily in order to finance its additional capital investments needed to sustain this period of rapid growth. Solvency is difficult to maintain as a firm expands rapidly

- *Stagnation Stage*

Following years of rapid growth during which the firms in an industry tend to acquire stable market shares, come years of slower growth which comprise the third stage. Mature growth companies may be large corporations, they may begin to pay consistent cash dividends and they repay any excessive debt they acquired during their period of rapid expansion. At this point the product has reached its full potential for use by consumers and profit margins become narrower. Firms at his stage sometimes are categorized as cash flows, having reasonably stable cash flow but offering little opportunity for profitable expansion. The cash cow is best 'milked from' rather than reinvested in the company.

- *Decay Stage*

In this stage, the industry might grow at less than the rate of the overall economy, or even it might even shrink. This could be due to obsolescence of the product, competition from new products, or competitions from new low cost suppliers. Customers have changed their habits, style and preference. So the industry becomes obsolete and gradually ceases to exist. The changes in the technology and declining in the demand are the major causes for the decay of an industry. The investors should disinvest when signals of decline are evident.

The life cycle theory is better for explaining the behavior of industries than it is for explaining the behavior of individual firms because

many firms fall in to bankruptcy during stages one and two. Even in those cases it is applicable, the life cycle approach can be difficult to interpret because there are no set time dimensions on a product's life. The experience of most industries suggest that they go through the four phases of the industry life cycle, though there are considerable variations in terms of the relative duration of various stages and the rates of growth during these stages. Because of these variations, it may not be easy to define what the current stage is, how long it will last, and what would be its precise growth rate.

4.3.3: Industry structure and characteristics:

Evaluation of industry structure and characteristics is an inevitable task of a security analyst in order to reach a considered investment decision. In an industry analysis, any number of key characteristics should be considered at some point by the analyst. Since each industry is unique, a systematic study of its features and characteristics must be an integral part of the investment decision process. At this stage Industry analyst normally focuses on the following:

- Structure of industry and nature of competition: Here his attention on the number of competing firms, industry leaders, entry barriers, pricing policies of firms, product differentiation, competition from foreign firms, product features of substitutes available etc…

- Nature and prospects of demand: In order to understand the nature and prospects of demand for products in an industry one should identify the major customers and their requirements, key determinants of demand, degree of cyclicality in demand, expected rate of growth in the future etc…

- Cost structure, efficiency and profitability of industry: This could be measured by proportion of key cost elements, labor productivity, liquidity conditions, profit margins, return on investments and earning power etc...

- Technology and research: Importance shall be given to degree of technological stability, technological changes, Research and Development expenses as a industry sales, the proportion of sales growth attributable to new products etc…

4.3.4: Profit potential of Industries

Industrial companies are engaged in the production and sale of commodities and services under competitive conditions. There are many factors which impel competition in an industry and decide its strength or weakness. So every security analyst seeking a particular sector for his or his client's investments shall take effort to understand the industry context in which the firms operates thereby he can reach a rational judgment as to its profit potentials.

4.4: Porter's five forces – A model for Industry analysis

Michael Porter (1985) provided a framework for analyzing the competitive conditions prevailing in an industry and its relation with the industry's profitability. In his model Porter has identified five competitive forces those altogether can drive competition or determine the profit potential or strength of an industry. The forces identified by Porter in his study include-

1. Threat of new entrants

2. Rivalry among the existing firms

3. Pressure from the substitute products

4. Bargaining power of buyers

5. Bargaining power of sellers

1. Threat of New Entrants:

New entrants to an industry put pressure on price and profits. Even if a firm has not entered an industry, the potential for it to do so places pressure on prices, because high prices and profit margins will encourage entry by new competitors. Therefore barriers to entry can be a key determinant of industry profitability.

Barriers to entry arise from several sources. Sometimes government creates barriers by restricting competition through the granting of monopolies and through regulation. Ideas and knowledge that provide competitive advantages are treated as private property when patented, preventing the others from using the knowledge and thus creating a barrier to entry. When an industry requires highly specialized technology or plants and equipment, potential entrants are reluctant to commit to acquiring specialized assets that cannot be sold or converted in to other uses if the venture fails. Most cost efficient level of production ie Minimum Efficient Scale (MES) which indicates the point at which unit costs for production are at minimum is another important barrier to entry for firms. To operate at less than MES there must be a consideration that permits the firm to sell at a premium price – such as product differentiation or local monopoly.

2. Rivalry among the existing players

When there are several competitors in an industry, there will generally be more price competition and lower profit margins as competitors seek to expand their share of the market. Slow industry growth contributes to this competition because expansion must come at the expense

of rival's market share. Industries producing relatively homogeneous goods are also subject to considerable price pressure, because firms cannot compete on the basis of product differentiation. When the customers of the industry can freely switch from one product to another there is a greater struggle to capture customers which increases rivalry.

3. Pressure from substitute products

Pressure from substitute products means the industry faces competition from firms in related industries. To the economist, a threat of substitutes exists when a product's demand is affected by the price change of a substitute product. The availability of substitutes limits the prices that can be charged to customers.

4. Bargaining power of buyers

The bargaining power of buyers is the influence that the customers have on a producing industry. If a buyer purchases a large fraction of an industry's output, it will have a considerable bargaining power and can demand price concessions. Sometimes the buyers possess a credible backward integration net thereby can threaten to buy the producing firm or its rival. But when the products are not standardized the switching cost to buyer will be very high which constraints the buyer to switch from one product to another frequently.

5. Bargaining power of suppliers

A producing industry requires materials, labor and other supplies. This requirement leads to buyer supplier relationships between the industry and the firms that provide it the supplies used to create products. If the suppliers of a key input has monopolistic control over the product or they

supply critical portions of buyers input, then the supplier can demand higher prices for the goods supplied and squeeze profits out of the industry. Here the key factor determining the bargaining power of suppliers is the availability of substitute products. If the substitutes are available, the supplier has little clout and cannot extract higher prices.

Michael Porter identified three generic strategies – cost leadership, product differentiation and focus that can be implemented at the business unit level to create competitive advantage. The proper generic strategy will position the firm to leverage its strengths and defend against the adverse effects of the five forces.

4.5: Data and Methodology

For the purpose of the study, five industries namely Energy, FMCG, Information Technology, Pharmaceuticals and Automobiles were considered based on the availability of the data. The logic behind the inclusion of these sectors is to bring in to the effect of industries sensitivity to business cycles. CMIE database has been accessed for getting the financial data pertaining to the sectors selected under study. Monthly closing values of the indices representing these sectors were used for ascertaining the sector wise stock returns. Among these five indices, all four indices except, automobile are NSE indices. Since NSE is not publishing any Automobile sector index, the index representing Automobile stock movement has taken from Bombay Stock Exchange. Banking sector index is not included because the performance of banking sector and stock market in most of the cases are complimentary to each other. Similarly Realty and Infrastructure indices could also not to be included as these indices has been compiled and published by stock exchanges in India since 2005 only, the

inclusion of which definitely lacks data consistency in comparison on time period basis. As many of the sector indices values are available from the financial year 2001-02 only, this part of analysis covered only nine years from that financial year to 2009-10.

Description of methodology used for the analysis is given in the just preceding paragraph of each part of analysis.

4.6: Analysis of Industry data

On the basis of the literature discussed earlier, first of all an effort has been made to analyze the performance of all selected industrial sectors during the study period. Here only quantitative (financial) variables pertaining to industries have considered for the purpose of the analysis. At first the financial performance analysis of the five industrial groups has made, thereafter the performance of stocks pertaining to those sectors is evaluated. Later an empirical model is constructed for ascertaining the causality between sector performance and stock returns.

4.6.1: Financial performance of Industrial sectors

For evaluating the financial performance of industries Accounting ratios are computed and meaningfully interpreted. Seven financial ratios/variables explaining different dimensions of financial positions are computed for this purpose. The accounting ratios computed for the purpose include income growth, export sales to total sales, debt to equity, current ratio, fixed assets to total assets, return on investment and employee cost to total expenses. The income growth represents the growth prospects of the industry, share of export sales in total sales revenue indicates its dependency on foreign market for revenues and also its potential to market expansion;

debt to equity is a measure of financial leverage as well as financial risk by employment of borrowed funds; current ratio measures liquidity conditions, indirectly the state of piling inventories; return on investment measures the efficient use of capital employment in the industry; fixed assets to total assets measures capital intensity indirectly the degree of operating leverage and employee cost to total expenses measures its level labour orientation.

When we look into the financial results with respect to five industrial sectors reported in Table 4.1 it can be easily understood that there has been sector wise difference in the performance of industries in India in terms of various financial measures. The rate of growth in income of all selected sectors is showed volatility during the study period. But there exists difference among them in terms of the lag in their sensitivity to swings in the economy. For example the economic recession in the global economy has made most hit on the Automobile sector in 2009, the sectors like Information Technology and Energy were received its banes in the subsequent year only. Similarly Pharmaceuticals and FMCG were able to withstand the crisis without incurring much dilution in their earnings growth.

With regard to the profitability, the performance of FMCG is far ahead of other sectors. Its return on investment measure has been improving year by year. Initially sectors like Information Technology and Automobiles gained increase in their profit at a rate much higher than the rate of growth in its investments during the first four to five years, but later they could not keep up that trend. The economic efficiency of the business of other two sectors– Pharmaceuticals and Energy, according to ROI measure are found less volatile or almost consistent throughout the period (although there has been slight decrease in the value of this measure for Pharmaceuticals during later years).

Table 4.1
Financial results of Five Industrial sectors in India for the period 2002-2010

Sector	Year	Income growth	Return on Investment	Employees cost to Total cost	% of export sales	Export earnings growth	Current ratio	Debt to Equity ratio	Capital intensity
Information Technology	2002	12.80	19.00	28.70	72.50	21.60	2.46	0.15	0.23
	2003	11.20	15.60	29.80	74.90	18.10	1.93	0.19	0.19
	2004	24.00	19.50	35.50	78.10	26.80	1.57	0.20	0.18
	2005	54.20	28.70	40.50	80.50	69.90	1.87	0.10	0.19
	2006	34.00	34.40	41.90	80.00	29.80	2.01	0.10	0.18
	2007	35.30	31.80	42.70	80.30	37.80	2.16	0.13	0.16
	2008	27.10	27.70	43.10	78.20	22.60	1.87	0.20	0.17
	2009	21.20	24.60	42.10	80.10	25.40	1.80	0.23	0.17
	2010	5.10	26.40	40.80	77.70	1.30	1.78	0.22	0.15
Pharma-Ceuticals	2002	10.80	23.00	8.50	24.40	28.20	1.52	0.71	0.35
	2003	11.40	22.70	8.10	28.00	31.70	1.47	0.69	0.32
	2004	17.00	24.60	8.60	29.70	24.00	1.42	0.73	0.31
	2005	5.40	21.00	9.00	30.40	9.00	1.34	1.07	0.29
	2006	17.80	21.30	8.60	31.20	18.40	1.33	1.07	0.27
	2007	24.70	24.20	8.40	35.50	37.10	1.45	0.82	0.26
	2008	16.70	21.30	8.50	35.70	17.90	1.33	0.75	0.26
	2009	12.10	14.70	9.10	38.20	21.10	1.36	0.66	0.24
	2010	10.50	18.60	9.70	39.00	9.40	1.46	0.53	0.25
FMCG	2002	2.50	39.20	5.10	12.70	1.60	1.15	0.27	0.34
	2003	-1.90	41.00	5.50	10.90	-13.60	1.13	0.20	0.29
	2004	2.80	41.00	5.40	10.90	2.30	1.06	0.50	0.29
	2005	3.40	31.80	5.60	11.40	7.50	1.16	0.45	0.30
	2006	10.20	36.80	5.10	10.50	3.80	1.07	0.20	0.29
	2007	14.30	40.20	5.40	10.50	12.60	1.05	0.22	0.23
	2008	16.00	44.60	4.90	13.00	31.60	1.02	0.35	0.27
	2009	18.40	45.00	4.90	10.00	-5.70	1.16	0.47	0.27
	2010	13.50	48.20	5.30	7.90	3.00	1.10	0.33	0.28
Energy	2002	-7.00	15.90	1.40	4.40	-3.50	1.23	1.00	0.50
	2003	14.50	22.50	1.30	4.90	28.50	1.27	0.77	0.42
	2004	11.20	25.20	1.20	5.80	30.40	1.16	0.62	0.39
	2005	22.10	21.70	1.10	8.40	77.50	1.31	0.57	0.35
	2006	26.40	16.90	0.90	10.20	52.30	1.24	0.69	0.41
	2007	24.00	22.30	1.10	13.80	65.20	1.11	0.65	0.41
	2008	14.50	22.50	1.10	15.30	28.00	1.19	0.71	0.33
	2009	21.30	13.20	1.30	15.50	11.20	1.01	0.90	0.34
	2010	-2.70	14.70	1.40	17.80	10.60	1.15	0.77	0.42
Automobiles	2002	2.70	7.80	6.80	3.80	-14.50	1.02	1.20	0.40
	2003	13.10	14.00	6.40	4.90	43.60	1.01	1.06	0.36
	2004	24.10	25.50	6.40	6.60	72.10	0.96	0.53	0.26
	2005	24.80	26.50	5.30	7.60	45.80	1.00	0.57	0.21
	2006	15.90	30.50	5.10	8.00	22.60	1.00	0.47	0.19
	2007	25.70	29.50	4.70	8.30	28.30	0.98	0.47	0.13
	2008	11.50	25.30	5.30	8.40	21.40	0.96	0.53	0.19
	2009	3.40	15.80	6.30	13.00	40.70	0.95	0.68	0.20
	2010	24.50	23.30	5.30	11.30	12.50	0.96	0.63	0.20

Source: CMIE data base

Among the group only Information Technology is found more labor intensive and more than 40 per cent of its total cost comprises of employees cost. Hence its capital intensity is at a very low degree (less than 20 per cent) in most of the years. Owing to lower capital intensity this industry may suffer far less from the depreciation shortfall. However the trend in the rate of increase in its employee cost compared to the rate of increase in its total cost is against the stand point of the rational investment that the best industry is one in which the labor cost represents a small portion of the cost of operations (Christy and Clendenin 1978, pp. 318). All other sectors in the group are heavily invested in expensive, long lived plant and equipment which would have enabled them to enjoy more operating leverage during good days of the economy. Heavy investments in long lived assets have high collateral values and in buying them the companies belong to these sectors can usually borrow a high percentage of the purchase price. Because borrowings are easy, they are over prone to rely on debt financing mode for its asset investment requirements.

Information Technology and Pharmaceutical sectors are more exposed to the foreign markets than the other sectors in the sample. Exports constitute the major chunk of the sales of the companies from IT sector in India. More than 80 per cent of their sales have been procured by this sector from its foreign market. Similarly around one third of the sales of the Indian Pharmaceutical industry have been constituted by exports. Lower growth of earnings from the foreign markets during the last few years has been noticeably affected the profitability of these two sectors in India. All other sectors considered for the study highly domestic market oriented and their global market penetration is marginal only.

On interpreting the current ratio it can say that the liquidity conditions prevailing in different sectors in India are neither uniform across sectors nor consistent across the time horizon. Information Technology industry is the only one sector which has maintained a reasonably good level of liquidity as its current ratio was almost equal to 2. The liquidity conditions of Pharmaceuticals are somewhat better than the remaining three sectors.

After gaining insight in to the divergence existing in the performance of different industrial sectors in an economy, the next step in security analysis process is to see whether such difference truly reflects in the market performance of their stocks or not.

4.6.2: Industrial stock returns – Descriptive statistics

Table 4.2 presents the summary statistics for the five industrial sector indices for the period 2002-2010. Minimum and maximum rate of return provided by each sector index during the period and their respective Mean, Standard Deviation (S.D) and Skewness are also reported. SD and Skewness are computed for explaining the volatility and normality of the distribution respectively. Lower rate volatility in the distribution of return indicates more consistency in market and lesser chance for investors to lose their money. Generally value for zero Skewness represents that the observed distribution is normally distributed. The Skewness coefficient, in excess of unity is taken to be fairly extreme (Chou 1969).

Table 4.2

Industrial stock returns – Descriptive statistics

	Minimum	Maximum	Return on annual basis	Std. Deviation	Skewness
Energy	-29.02	36.60	27.72	9.19	-.088
FMCG	-17.90	28.21	13.32	6.93	.303
Information Technology	-42.00	38.21	13.92	11.29	-.316
Pharmaceuticals	-24.38	16.48	20.02	7.14	-.534
*Automobiles	-26.92	31.80	23.16	9.28	-.002

Compiled from NSE Industry indices data   *BSE Auto Index data

The statistics shows that the return generating capacity of different sector stocks are not uniform during the study period. Moreover the variability of returns which is measured by both Standard Deviation and Range (difference between maximum and minimum of returns during a period) is also much different from industry to industry. When Energy sector scrip delivered a highest return of more than 27 per cent to its investors, two other sector indices -Automobiles and Pharmaceuticals were in second and third position by producing returns at the rate of 23 per cent and 20 per cent respectively. The performance of Information Technology and FMCG stocks in terms of return were far behind of other sector indices. But in risk terms the performance of FMCG sector indices outperforms other sector indices. Pharmaceutical stocks also showed more consistency compared to the stocks of remaining sectors. Stability in delivering returns to investors by Energy sector is almost similar to that of Automobiles during this period. Information Technology sector stocks proved to be the most

risky investments for investors as it has highest standard deviation of 11.29 per cent among the group. The variability in return from this sector in terms of Range is also considerably high (more than 80 per cent) compared to other sectors. Here it is also very interesting to note that the return profile of the most risky stock investment among the group – Information Technology sector stocks is somewhat poor which further creates an impression that the return from stock investments of all sectors shall not always be commensurate with its risk profile. Investment in IT sector stocks in India has not been better rewarded for the level of the risk that its investors actually assumed during the period of the study.

It can also be seen that frequency distribution of all the indices except Energy and Automobiles are not normal, but none of them showed any extreme skewness. Skewness coefficient for both Energy and Auto sector returns almost equal to zero which one way help to say that market for these two sectors is relatively normal. When IT and Pharmaceutical indices showed moderate degree of negative skewness indicating the greater probability of large decreases in prices rather than rises, FMCG sector showed low degree of positive asymmetry in its distribution of returns.

Thus the descriptive statistics itself shows that there has been inter sectoral differences in terms of return and risk performance of stocks in Indian stock market during the post financial liberalization period. Definitely there arises another question as to what factors make such divergence in the performance of stocks across the sectors. Before searching for the answers to this question it is very interested to familiar with the factors which the fundamentalists normally assume that could specifically influence the price behavior of stocks from a particular sector.

4.6.3: Stock returns and Industry variables - The empirical model

The model to be tested consists of 7 independent variables for the nine year period from April 2002 to March 2010. These independent variables potentially related to industry stock returns are described in some detail below. The expected directions of effects of these industry variables are also given in a multivariate regression context. These variables are selected on the basis of the review of available literature relating the performance of the industries and stock returns and all of them are the descriptive of the industry characteristics. The multivariate regression model takes the form:

$$Y_i = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + u_i$$

Where income growth is taken as variable x_1, export sales to total sales as x_2, debt to equity as x_3, current ratio as x_4, fixed assets to total assets as x_5, return on investment as x_6 and the variable employee cost to total cost is taken as x_7. The dependent variable Y_i, is the average monthly stock return of an industrial sector 'i' and β values measure the sensitivity of industry stock returns to each independent variable. α and u_i represent constant and error (assumed to be zero) terms respectively.

Step wise regression procedure (MaxR) is used by the study in an attempt to build more useful model than those incorporating all seven independent variables. MaxR begins with an independent variable that results in the highest R^2, and successively add variables at each iteration in order to maximize R^2. For this analysis a significant level of 0.01 is specified.

For checking whether there is any problem of collinearity in the data or in the model used VIF and Tolerance statistics has been computed. If the largest VIF is greater than 10 then there is cause for concern (Myers 1990) and the tolerance statistics below 0.2 indicates a potential problem of collinearity (Menard 1995) in the model.

Table 4.3

Stepwise Regression results

Model	β	Std. Error	t	P value	Tolerance	VIF	Adjusted R²
Constant	4.895	1.622	3.017	.009*	-	-	
Capital Intensity	17.875	3.416	5.233	.000*	.833	1.201	
Liquidity	-8.155	1.330	-6.131	.000*	..462	2.163	0.796
Share of exports	.101	.021	4.858	.000*	.211	4.732	

*Significant at one per cent level.

Table 4.3 presents the results from the stepwise procedures. For our current regression model the VIF values are all well below 10 and the tolerance statistics all well above 0.2; therefore we can safely conclude that there is no collinearity within the data used for the analysis. The average VIF also is much less than 10 and this confirms that collinearity is not a problem for this model also.

The regression results indicate that the average monthly stock returns of the five industrial sectors in India are affected by the changes in industry variables. However among the seven factors selected for determining its impact on industrial stock returns in India, only three factors - capital

intensity, liquidity conditions and share of exports are proved to be the strongest factors among the group. The relationship of stock returns with these three factors is exactly in accordance with the theoretical expectations. When the relationship of the stock returns with the capital intensity and export performance (measured through share of export sales) found positive and significant at one per cent level, its causal relationship between the liquidity conditions of different sectors found negative and significant at the same level. The value of adjusted R^2 indicates that about 80 per cent of the variations in industrial stock returns during the study period were altogether contributed by these three industry factors.

4.7: Information Technology (IT) Industry

Information Technology (IT) industry is the industry, which through the use of computers and other supporting equipment helps in the spread of knowledge. The term Information Technology includes computers and communication technology along with associated software. Hanna N and Dugonjic (1995) therefore, are of the view that in IT industry, "on the supply side are computer hardware and software, telecommunications equipment, and micro-electronics – based industries. On the demand side are applications of IT and all economic sectors."

Information Technology for sometime was used as synonymous to computers. But with the rapid advancement in various information delivery systems such as Radio, TV, Telephone, Fax and of course Computers and Computer networks, information Technology refers to the entire gamut of media and devices used to transmit and process information for use by various target groups in the society. IT has, therefore, been rightly termed as Information and Communication revolution.

With advancement in information technology information is being regarded as the fourth factor of production, along with the land, labour and capital. Information has therefore, become an important and distinct input in production. Thus along with three sector model of primary, secondary and tertiary industries, a fourth sector information related industries has emerged. Information is used as raw material of knowledge and the information industry has thus pervaded a wide range of industries, viz., manufacturing, education, entertainment, defense, trade, communications, etc.

At present the entire world is looking as a knowledge economy where raw material that matters is intellectual rather than physical. Low (2000) states: "The knowledge economy implies shift in the geographical centre from raw material and capital equipment to information and knowledge, especially in education and research centres and man – made brain industries." The pervasive influence of Information Technology is so strong that there is no sphere of human life in which it is not able to make a niche for itself.

Table 4.4 summarizes expected growth of Information Technology spending worldwide over the next 2 to 3 years.

Table 4.4

Worldwide IT spending forecasts

($ billion)	2007	2008	2009	2010	2011	2012	2008-12 CAGR (%)
IT services	528	557	578	605	636	672	4.8
ITeS - BPO	103	115	131	146	164	181	11.9
Services Total	**631**	**672**	**709**	**751**	**801**	**853**	**6.1**
Software	277	295	308	326	349	376	6.3
Hardware	570	594	597	620	652	683	3.6
Total	**1478**	**1561**	**1614**	**1697**	**1801**	**1912**	**5.2**

Source: International Data Corporation

Divergence in the growth of spending of IT in its various segments is expecting in the future. The total spending on IT is expected to grow at Compound Annual Growth Rate (CAGR) of 5.2 per cent globally. IT enabled Services (ITeS) spends are likely to grow at a faster pace of 11.9 per cent CAGR as compared with other segments within the IT industry. The lowest rate of growth is expected on the Hardware segment with only 3.2 per cent CAGR.

4.8: Information Technology (IT) Industry in India

Information Technology is of recent origin, but is spreading fast in India. It was in the 70's that the computer as a productivity tool started proliferating in the Indian industries scene. But it was only by mid 80's that the forecasters, analysts and Indian government policy planners began to understand the potential of the Indian talent in computer software. The realization led to the formulation of the computer software policy in 1986. Then the economists began to analyze the potential of the Indian IT industry. It would be they said, one of the fastest growing sectors of the economy and would provide high quality employment for young people. It would earn significant revenue from exports and would be a highly desirable industry, as it required skilled manpower, few raw materials and was not any way damaging to the environment.

With the huge success of the IT companies in India, the Indian IT industry in turn has become successful in making a mark in the global arena. This industry has been instrumental in driving the economy of the nation on to a rapid growth curve. As per the study of NASSCOM-Deloitte (2008),

the contribution of IT/ITES industry to the GDP of the country has soared up to a share of 5 per cent in 2007 (7 per cent in 2008 according to BMI) from a mere 1.2 per cent in 1998. Besides, this industry has also recorded revenue of US$ 64 billion with a growth rate of 33 per cent in the fiscal year ended in 2008.

4.8.1: Indian IT industry: its component segments

The Indian IT industry can be segregated in to four main components: software products and engineering services, IT services, IT – enabled services and hardware. The services of the industry are spanned over various segments covering software development, software services, software products, consulting services, BPO services, e-commerce and web services, engineering services off shoring and animation and gaming. Banking, Financial Services and Insurance (also known as BFSI) is an industry name commonly used by IT/ITES/BPO companies to refer to the services they offer to companies in these domains.

From Table 4.5 it came to know that the Indian IT industry has grown at a remarkable pace since 2001-02. The overall revenue of the industry is estimated to have grown from USD 10.2 billion in 2001-02 translating to a CAGR of about 26.9 per cent. Despite the severe global recession, the industry grew at modest rate of 12.9 per cent in 2008-09. Table 2 reviews the performance of Indian IT-ITeS Industry in terms of its revenue growth (domestic and exports) during the period 2001-02 to 2008-09.

Table 4.5

Indian IT - ITeS industry Revenue Trends

($ billion)	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	CAGR (%)
Exports revenue (excluding hardware)	**7.6**	**9.5**	**12.9**	**17.7**	**23.6**	**31.1**	**40.4**	**46.3**	**28.6**
IT services	5.8	5.5	7.3	10.0	13.3	17.9	23.1	26.5	23.2
ITeS – BPO	1.5	2.5	3.1	4.6	6.3	8.4	10.9	12.7	39.2
Software products & Engineering services	0.3	1.5	2.5	3.1	4.0	4.9	6.4	7.1	48.5
Hardware	N.A	N.A	0.5	0.5	0.6	0.5	0.5	0.3*	-9.7
Domestic revenue (excluding hardware)	**2.6**	**3.0**	**3.8**	**4.8**	**6.7**	**8.2**	**11.7**	**12.4**	**22.2**
IT services	2.1	2.4	3.1	3.5	4.5	5.5	7.9	8.3	19.5
ITeS – BPO	0.1	0.2	0.3	0.6	0.9	1.1	1.6	1.9	44.5
Software products & Engineering services	0.4	0.4	0.4	0.7	1.3	1.6	2.2	2.2	23.7
Hardware	N.A	N.A	4.4	5.2	6.5	8.0	11.5	11.8*	21.8
Total (excluding hardware)	**10.2**	**12.5**	**16.7**	**22.5**	**30.3**	**39.3**	**52.0**	**58.7**	**26.9**
Export density (%)	**74.5**	**76.0**	**77.25**	**78.67**	**77.89**	**79.13**	**77.69**	**78.90**	-

Source: Department of Information Technology and CRISIL research reports　　　　*Estimated

Exports continue to dominate the revenues earned by the Indian IT industry. The export intensity (ratio of export revenues to total revenues) of the industry has grown from 74.50 per cent in 2001-02 to 78.90 per cent in 2008-09. Total IT exports is estimated to have increased from USD 7.60 billion to USD 46.30 billion in 2008-09, a CAGR of 28.60 per cent. Analysis of segment wise export revenue trends shows that the software product is the fastest growing segment with CAGR 48.5 per cent. The share of exports from ITes -BPO segment has nearly doubled during the study period. But the rate of growth in revenues from Hardware segment is abnormally low in global market.

Though the IT-BPO sector is export driven, the domestic market is also significant. The revenue from the domestic Software and Services market is estimated to have grown USD 2.6 billion in 2001-02 to USD 12.4 billion in 2008-09 a CAGR of about 22.2 per cent. ITeS-BPO segment in the domestic market has witnessed noticeable growth over the past few years. Modest growth in hardware demand could be seen in domestic market which is mainly driven by consumer Note book purchases. NASSCOM said that the domestic IT-BPO revenues excluding hardware are expected to grow at 16 per cent to reach USD 17.35 billion in the FY 2011.

4.8.2: Export destinations of Indian IT industry

US and UK continues to be the major markets for the IT software and services exports (Table 4.6). However the share of USA has declined from 68.30 per cent in 2004-05 to 60 per cent in 2007-08, whereas that of

Europe has increased from 23.1 per cent to 31 per cent over the same period. Markets across Continental Europe and the Asia Pacific are also witnessing significant year on year growth. This trend towards a broader geographic market exposure is positive for the industry, not only as de-risking measure but also as a means of accelerating growth by tapping new markets. The economic downturn in these markets might be a serious concern for the future growth of this industry.

Table 4.6

Major export destinations of Indian IT industry

Market	2004-05 (per cent)	2005-06 (per cent)	2006-07 (per cent)	2007-08 (per cent)
Americas	68.30	67.18	61.40	60.00
Europe	23.10	25.13	30.10	31.00
Rest of the world (incl. APAC)	8.60	7.69	8.50	9.00

Source: Department of Information Technology, Govt. of India

4.8.3: Number of IT companies in India

National Association of Software and Services Companies (NASSCOM) is the premier trade body and the chamber of commerce of the IT-BPO industries in India. So almost all relatively well performing IT companies in India has already become the members of this trade body. The distribution of number of member companies in NASSCOM over the last 10 years reported in Table 4.7 shall give better approximation for the breadth of

the Indian IT industry as well as intensity of the competition among the firms there.

Table 4.7

Number of IT companies having membership in NASSCOM

Year	No. of IT companies
2000-01	686
2003-04	840
Dec- 2006	1138
Dec- 2008	1246
Dec-2010	1250

Source: NASSCOM Annual report 2011.

Size of the member ship in NASSCOM has almost doubled during the period. Such a dazzling growth in the number of IT companies in India reflects the optimism of the entrepreneurs in the growth potential of IT – BPO sector in the country. But the increased number of firms in the sector could intensify the competition among firms in the industry which might be become a barrier for the individual growth of most of the firms.

4.8.4: SWOT analysis of Indian IT industry

Business Monitor International Ltd. a leading business research team has made a SWOT analysis of India IT industry.

Strengths	• Abundant availability of skilled and technically qualified manpower with English-language proficiency
	• A major global centre for outsourcing, including business process outsourcing (BPO)
	• Domestic IT project sizes increasing
Weaknesses	• Weak IT patent protection and high piracy rates
	• Ministry of Communications and Information Technology often slow to bring forward regulations and guidelines for IT sector
	• Low incomes and regional disparities
	• Multinationals dominate; still no global Indian IT software or hardware brands
	• Red tape and rigid labour laws
Opportunities	• Hardware sector growth set to accelerate after a number of government measures to encourage domestic manufacturing and new investment incentives under consideration
	• Government creating framework to meet ambitious targets for IT investment in regions such as Chennai
	• Recovery in demand for research and development services
Threats	• Global economic slowdown and rising costs will impact on consumer and business sentiment
	• The financial crisis will hit key financial sector outsourcing clients
	• Competition from China and other Asian countries for global BPO market share
	• Moves to stimulate the hardware sector are having mixed results

4.9: Industry structure and profit potential of Indian Information Technology Industry – Michael Porter model

The maturation of an industry involves regular changes in the firm's competitive environment. As a final part in Industry analysis, the study examines the relationship among the Indian Information Technology industry structure, competitive strategy and profitability. For this purpose the study has used a model developed by Michael Porter (1985) for analyzing the competitive conditions prevailing in an industry and its relation with the industry's profitability.

A brief explanation of the working of the model explaining the competitive forces mentioned by Porter in the Indian Information Technology context by affecting its profitability and growth potential has been made in the following discussions.

1. Entry and exit barriers

In India both Central and State Governments are more supportive rather than restrictive by creating conducive environment for the development of Information Technology sector in the country. Government of India has been taking a lot of pro active measures for encouraging the new investment to the industry (making the entry of new firms to the industry more easy) through creating Special Economic Zones and by providing fiscal and non fiscal incentives. Income tax holiday for profits from IT exports (Sec 10A of Income Tax Act 1961), procurement of capital goods and other inputs at zero rate of excise duty, manufacture of IT software products at zero rate of excise duty etc… are some of such measures. Since major portion of this sector constituted by services, the production of which requires least amount of capital investments facilitates

free entry and easy exist by the firms from the industry. India is the hub of cheap and skilled software professionals, which are available in abundance which helps the Information Technology companies to develop cost-effective business solutions for their clients. This attracts new entrants to the sector which makes it more competitive in structure. Moreover the products offered by different firms in this sector are virtually identical; the rooms for product differentiation are very limited. Such a competitive environment of the industry makes the profitability of the sector often nominal or low.

2. Competitions

The Indian IT services market is highly competitive. Competitors include global consulting firms, sub divisions of large multinational Technology firms, IT outsourcing firms, Indian IT service firms, software firms and in house IT departments of large corporations. The increased acceptance of the global delivery model has driven MNC service providers to expand their base within India and encourage in predatory pricing. In order to counter this menace Indian firm has to invest more in Research and Development (R&D) and selling and marketing which again reduces their profitability. Increasing competition from China and other Asian countries for global Business Process Outsourcing market share is also a big threat to this counterpart of Indian IT industry (Business Monitor). Stiff competition, rapid technological changes and high rate of piracy demand frequent product introductions and enhancements which in turn pressure the firms in the industry to invest heavily in the Research and Development and marketing of new products, services and technologies, while keeping a constant check on piracy. As most of the products and services are standardized in form the customers of the industry can freely switch from

one product to another and there is a greater struggle to capture customers among the market players which intensifies the severity of rivalry. All these actions most of the cases reach price wars among firms which negatively affects their operating margins.

3. Buyers and markets

Corporate buyers, who account for a substantial portion of the market, are highly price sensitive and enjoy bargaining power. It is fairly easy to switch from one brand of computers to another as most of the computers use Intel microprocessors and Microsoft window operating systems. Until 2008, IT services players mostly faced margin pressure on the grounds of wage inflation and retention/attrition costs. However later environment has brought forth a whole set of challenges, putting margins under pressure because of dwindling of dollar revenue growth led by decline in billing rate and stronger rupee. Exports account for nearly 64 per cent of the Indian IT industry (NASSCOM). Nearly 80 per cent of this revenue derived from US and UK. US alone constitute more than 60 per cent of India's IT exports. BFSI sector (Banking, Financial Services and Insurance) is the key vertical for the Indian IT services industry which accounts for two – fifth of the Indian IT exports (CRISIL). Owing to the overwhelming dependence on these two regions for their overseas business operations the downturn in these two economies especially, in times of the global meltdown has terribly affected the earnings of Indian IT industry. The brunt of slowdown in BFSI sector makes its profit margins under more pressure. The prevalent political climate in these countries and changes in government policies there with regard to the IT sector (For eg: debate over outsourcing in US) may impact player margins. More over the heavy

dependence on exports makes the industry vulnerable to the fluctuations of Indian rupee against the major currencies of the world such as US Dollar, British Pound, Euro etc.. The appreciation of Indian rupee against these prime currencies during the past few years has been put the margins of IT players at risk.

4. Suppliers

Since major inputs of the product supplied by Information Technology firms constitute Processors, Operating Systems and Personnel (IT programmer or Professional) the bargaining power of suppliers in the IT industry is very high. A major cost component in the IT industry is employee related costs. These costs are also subject to a great deal of inflationary uncertainty. Also, as competition within the industry intensifies, the need for skilled man power gains dominance, firms also increasingly poach on each other's employees by offering better Pay packages. This results in a rise in employee costs, which in turn affects their margins. The suppliers of the other inputs to IT industry also exert big influence on the profit margins of its players. This is because the US computer giants 'Intel' dominate the microprocessor production and 'Microsoft' controls the operating systems market in the Industry. So whatever be the product manufactured by the firms in this industry they have to heavily depend on these multinationals to get their supplies. If they want to switch their suppliers (like AMD for processors, LINUX for OS etc.) due to the inherent nature of their products it is more expensive for them.

Thus from the above discussions it is rational to say that the presence of these competitive forces in the Information Technology sector of India has been considerably affected the performance of its member firms and

most often they force to operate at a margin which is much less than that of firms from other Industrial sectors of the economy. Even though there has been no substitutes for almost all of the products or services offered by the industry, the prevalence of other forces at aggravate level constrains the ability of firms in the industry to raise prices. More over high degree of exposure to the external markets, the economic crisis in the developed world and currency fluctuations is expected to have negative impact on the revenue growth of Information Technology Industry of India in the near future.

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Chapter 5

COMPANY ANALYSIS

5.1: Introduction

Identifying the factors important in explaining contemporaneous equity prices/returns has long been a focus of share valuation research. A security analyst who believes in fundamental approach to valuation of stocks, practices the same through Economy Industry Company (EIC) framework for assessing the true worth of a stock. After successfully identifying the key economic and industry variables he now turns to explore the relevant company specific factors which can make significant impact on the prices of stocks traded in a market. Such a process in security analysis in which the analysts trace out the prominent company variables that determine return from specific company scrip is called company analysis. At this stage security analysts assimilate several bits of information related to the company and evaluate the present and future values of the stock. The valuation process depends on his ability to elicit information from the relationship and inter relationship among company related variables.

5.2: Significance of company analysis

Industry factors alone cannot explain all the price movements of a common stock (King 1966). Even if all indications are that the industry has very favorable future prospects, this does not necessarily imply that funds should be committed to it immediately. Although all the firms in most industries tend to be somewhat similar, they are not homogeneous. Differences in the quality of similar products, the adeptness of different firms' management, the aggressiveness of each firm's sales efforts, differences in the size of the competing firms, difference in the legal patents held by each firm and other factors can result in significant variations among firms which are all competing in an industry to manufacture a similar product.

Many research works have reported wide variations between the firms in a given industry. Cheney (1970) reported a tendency for the firms in non growth industries to behave somewhat similarly. On the other hand Cheney found that firms in growth industries tended to perform dissimilarly. Studies made by Gaumnitz (1970), Meyers (1973) and Livingston (1977) all found strong positive co movement between the stock prices of firms within some industries. In the majority of industries, however, this co movement was only weakly positively correlated. The findings of these empirical researches lead to a coherent deduction that a high proportion of each firm's stock price movements will be determined by the factors which are unique to that firm which attest to the need for analysis of individual firms to supplement industry analysis.

A decision to purchase is not based only on the current status and future prospects but also current prices of securities in the industry. The

security analyst shall identify the operationally efficient companies in each particular industry since this is where good investment values could be found by him. He should also assess its real worth of the stock based on the information collected by him. In fact, company analysis attempts to study the prominent factors that specifically affecting or indicating the performance of the company.

5.3: Company analysis – information requirements and its sources

Usually the success of a firm in an industry is determined by a host of factors including competitive edge of the company, its quality of management, technology, market share, dependence on labor, capital structure, operating efficiency, earning power etc. Some of these factors are quantitative and some others are of qualitative nature. Since a research pertaining to the arena of financial economics especially in equity research focus mainly on quantitative variables, the company analysis made in this study takes in to account only the quantitative variables for determining the performance of each firm in the sample.

The most immediately recognizable effect of economy and industry influences on a specific company is probably the impact on revenues. From the view point of individual company adjustments to changes in the general business cycle can be different from those of the industry in general. Product mix and pricing peculiar to specific firms can cause total revenues to respond more or less to broad economic – industry impact. Diversified product lines allow a company to spread cyclical effects.

Revenue changes in firms in the same industry with identical product mix or product policies may lead to different relative changes in cost. The

relationship of revenues and expenses to economic and industry changes and the resulting earnings is the focal point of company analysis (Fischer and Jordon, 1992).

5.4: Financial analysis

Information contained in an enterprise's financial statements constitutes an important input to the company analysis. An overwhelming weight is placed by analysts and investor on the information contained in the financial statements of firms. One critical reason for this reliance lies in the vouchsafed nature of the statements, because their form and content is controlled under a variety of rules, regulations and statutes. The vast majority of these statements are attested by independent auditors. In sum, investors tend to accept financial statements as the closest things to complete credibility in information available to them. Moreover the financial data is the only source of information which readily available to an investor/analyst.

Financial statements of companies which normally comprised of Income statement and Position statement are the primary sources of investment information for evaluating the investment prospects in a specific stock. The statements give historical as well as current information about the corporate performance.

There is a danger in looking at single figures on individual statements in an isolated year. So a prudent analyst must rely upon the total impact of all financial statements taken as unit overtime. He will look at the financial statements taken as a whole and understand how the major statements are interrelated.

Financial statement analysis is the study of a company's financial statements from various dimensions such as profitability, liquidity, solvency, operating efficiency etc… It is the process of identifying the financial strengths and weakness of a company by properly establishing the relationship between the items of various financial statements. Financial statement analysis gives us a good amount of ammunition for evaluating a company's performance and future prospects. The most powerful tool of financial statement analysis is ratio analysis where we consider a particular ratio as a benchmark for evaluating the performance of the firm with respect to a specific financial aspect (Khan and Jain, 2008).

5.5: Financial ratios analysis

The major focus of the fundamental approach in valuation of stocks is to identify the underlying fundamental forces that drive stock returns in a market. The biggest part of this approach delves in to quantitative analysis looking at revenue, expense, assets, liabilities and all other financial aspects of a company or industry. Fundamental analyst always looks at this information to gain insight on a company's fundamentals, hence an elaboration on the practice usually he pursues in order to make out the meaning and scope of underlying financial variables here is demanded for having better understanding at the time of its use in analysis.

Companies despatch their annual reports once every accounting year (normally 12 months) and these reports run into hundreds of pages. As accounts are prepared using the double-entry system, every item is linked to at least one other item. When such relationship between the variables in financial statements expressed in mathematical terms, they are called

financial ratios which would help one to easily understanding a company's performance over the period and across the industry.

Financial ratios are broadly classified as profitability, solvency, liquidity, and activity (turnover) ratios. This part of the report shall discuss the theoretical backdrops of only those financial ratios which have been used for assessing the various dimensions of financial performance of companies under study. While making discussions, thrust is given to the profitability ratios, as the investors are more concerned with the company's earnings than with its operational efficiency, capital structure or its ability to meet debt obligations.

5.5.1: Profitability ratios

Profitability ratios show how productively the company's capital is being employed in the stake holder's interest. It is a class of financial metrics that are used to assess a business's ability to generate earnings as compared to its expenses and other relevant costs incurred or total investment made during a specific period of time. For most of these ratios, having a higher value relative to a competitor's ratio or same ratio from a previous period is indicative that the company is doing well. Further divisions of profitability measures can be made in:

5.5.1.a: Margin ratios (profitability ratios related to sales)

Margin ratios, one of the key measures of profitability, show the efficiency of the firm in retaining revenues. These can be classified further into operating margin and net profit margin ratios.

- Operating margin

Operating profit margin or operating margin is the percentage of revenue earned in excess of production, administration and selling and distribution costs. The operating margin ratio is calculated by dividing the operating income (net sales minus production, administration and selling and distribution costs) by net sales. Volume, realizations or billing rates and operating cost per unit are among the key factors that drive this ratio.

- Net profit margin

The net profit margin or net margin, another key measure of profitability, is calculated by dividing post-tax earnings by net sales. It is the percentage of revenue that accrues to the owners of the entity. This ratio is a function of the operating margin, interest coverage and the rate of incidence of tax. While high margins are desirable, as they provide a cushion against the risk of adverse changes, investors need to look at the structure of the margins to determine the sustainability and scope for improvement.

5.5.1. b: Profitability ratios related to investments

- Return on investments

Return on investment (Earnings before Interest and Tax to Total Investments) measures the overall effectiveness of management in generating profits with its available assets. This ratio also indicates the profitability of an entity's capital investments. If this ratio is lower than the rate at which the company borrows, any further rise in debt will lead to negative earnings growth.

- Return on Net worth

    This ratio indicates an entity's profitability and efficiency, and is arrived at by dividing earnings after taxes by the shareholder's funds. This ratio, a combination of three underlying factors, is related to profit margin, asset management, and leverage. When an investor goes by the price-to-book value measure, he should consider this ratio as it aids in measuring the rate at which a company improves its shareholder funds. Although a high RONW is desirable, the stability of this ratio plays a significant role.

- Earnings Per Share (EPS)

    EPS measures the profit available to the equity shareholders on a per share basis. It is calculated by dividing the profit after taxes by the total number of equity shares outstanding. EPS is a widely used ratio for judging profitability of an equity investment. Yet, it as a measure of profitability of a firm from the owner's point of view should be used cautiously as it does not recognize the effect of increase in equity capital on account of retention of earnings.

- Book Value Per Share

    Book value represents the claim of the shareholder on a per share basis. It is computed by dividing the shareholders net worth by the number of equity shares outstanding. This ratio sometimes is used as a benchmark for comparison with the market price per share. However it has a serious limitation as a valuation tool as it is based on the historical costs of assets of the firm.

- Price to Book value ratio (P/B ratio)

P/B ratio measures the relationship between the market price of an equity share and its book value. It reflects the price that the investors are willing to pay for every rupee of book value per share. It is significant in predicting future stock returns. Firms with low P/B ratios had consistently higher returns compared to the firms with high P/B ratios (Fama and French 1992)

- Dividend per share (DPS)

DPS is the net distributed profit belonging to the ordinary shareholders divided by the number of ordinary shares outstanding. The DPS would be a better indicator than EPS as the former shows what exactly is received by the owners. Like EPS, the increased dividend per share may not be a reliable measure of profitability as the equity base may have may have increased due to increased retention without change in the number of outstanding shares.

- Dividend Pay-out ratio (D/P ratio)

D/P ratio shows what percentage share of the net earnings is paid out as dividend to the equity shareholders. It can be found out by dividing the DPS by the EPS. When this ratio is subtracted from 100, we get profit retention ratio. The D/P can be compared with the trend over the years or an inter-firm or intra-industry comparison would throw light on its adequacy.

- Dividend yield

It represents the ratio between the current cash return by way of dividend to its investors and their level of investment in current market

value terms. Generally a positive relationship is expected   between dividend yield and stock returns.

- Price Earnings ratio(P/E ratio)

P/E ratio measures the amount investors are willing to pay for each rupee of earnings. It measures investors' expectations and the market appraisal of the performance of a firm. This ratio is popularly used by security analysts to assess firms' performance as expected by the investors. The higher the ratio, the larger will be the investors' confidence in the future. But sometimes it could be taken as an overvaluation of stock in the market.

5.5.2: Short term/Long term solvency ratios

5.5.2.a: Short term solvency ratio

Short term solvency position also called liquidity conditions of a firm indicates its ability to meet short term obligations in time. Current ratio is the most common ratio for measuring   liquidity of firms by analysts. Current ratio is defined as ratio of current assets to current liabilities. In a sound business firm a current ratio of 2:1 is considered as an ideal one.

5.5.2.b: Long term solvency ratio

The long term creditors would judge the soundness of a firm on the basis of long term financial strength measured in terms of its ability to pay the interest regularly as well as repay the installment of the principal on due dates, or in one lump sum at the time of maturity.

Debt equity ratio, the ratio of long term debt to shareholders equity is the most popular measure of long term financial solvency of a firm. It has important implications from the point of all stakeholders in business,

particularly shareholders. Relatively higher proportion of debt helps the shareholders to enjoy trading on equity or leverage. More specifically with a larger proportion of debt in the financial structure, the earnings available to owners would increase more than proportionately with an increase in the operating profits of the firm, if it is able to earn on the borrowed funds a rate higher the fixed charge on loans. The leverage can, of course, work in the opposite direction also, if the return on borrowed funds is less than the fixed charge. Such situations sometimes cause dilution in book value of the firms, as they have to service the debt by making use of capital invested in business.

There cannot be a rigid rule as to reasonable relationship between debt and equity. It depends upon the circumstances, the prevailing practices and so on. It is not unusual to find firms having a D/E ratio of 2:1 or even 3:1 in the case of joint stock companies in India (Khan and Jain, 2008). Hence it is logical to take 2:1 as the ideal D/E ratio for a firm in India to infer on its financial soundness.

5.5.3: Cost structure and Operating leverage

The ability of a firm to use fixed operating charges to magnify the effect of change in sales on its Earnings before Interest and Tax (EBIT). In this situation percentage change in profit on account of increase in sales shall be higher than percentage change in sales volume. A business that has a higher proportion of fixed cost and lower proportion of variable cost is said to have used more operating leverage. Those businesses with lower fixed cost and higher variable cost are said to employ less operating leverage. Usually industries such as public utilities, automobiles, refineries etc. require larger investment in fixed assets such as machinery equipment,

land etc, and consequently such industries will have a high degree of operating leverage. So capital intensity ratio (proportion of fixed asset investments to total asset investments) could be taken as a measure of operating leverage.

5.5.4: Other measures used

- Beta

Beta represents market risk coefficient and measures how the individual security is sensitive to the changes in benchmark index return. Values of beta were measured by using simple regression model, where security return taken as dependent variable and return from benchmark index – Nifty as independent variable. The beta are estimated with the help of the following equation:

$$R_i = \alpha + \beta_i R_m + u_i$$

R_i = Return from individual se.

α = Intercept of a straight line or alpha coefficient.

β_i = Beta coefficient of ith security.

R_m = Return on benchmark index.

u_i = Error term with zero mean and constant standard deviation

- Market Capitalization (market cap)

Market cap is used to represent the size of a firm. It is the product of market price of the firm and the number of its shares outstanding.

- Annual return (AR)

Annual return from a share investment comprises of dividend received for a share investment in a company and its price change over the year ie. capital gain. The sum of these two returns as a percentage of the price of the investment at the beginning gives annual return.

5.6: Financial statement analysis of selected companies

In this chapter with the help of some key financial ratios effort is taken to explore the sources of profitability of selected companies, evaluate the quality of their earnings, measure their the short term as well as long term solvency positions and assess the investment performance of their stocks in a systematic fashion. All companies are from Information Technology sector and which has been trading continuously in National Stock Exchange of India from the beginning of the study period ie from the financial year 2000 -2001. Required data were taken from the published annual reports of respective companies.

5.6.1: Infosys Technologies Ltd.

Infosys Technologies Ltd is a public limited and India's second largest software exporter company was incorporated in the year 1981 as Infosys Consultants Pvt Ltd by Mr.N.R.Narayana Murthy at Karnataka. The company was started by seven people with the investment of USD 250. The company became a public limited company in the year 1992.

Infosys Technologies Limited offers business solutions equipped with technology. The company offers various services which include business and technology consulting, application services, systems integration, product engineering, custom software development, maintenance and re-engineering services in the IT space. It also offers

software products for the banking industry across India and overseas. The company also provides business process management services, such as offsite customer relationship management, finance and accounting, and administration and sales order processing.

At present the United States of America constitutes major chunk of Infosys's global market. But now it is looking to increase its presence in Europe and emerging markets perceiving faster growth in these markets, in an attempt to reduce its dependence on the US. Infosys also takes pride in building strategic long-term client relationships. According to Financial Strategic Analysis and Review of Infosys Technologies Ltd., over 97 per cent of its revenues come from existing customers'

The company was the first Indian company to be listed on the NASDAQ in 1999. It forms a part of the NASDAQ-100 index. Continuously in the year 2001, 2002 and 2003, the company won the National award for excellence in corporate governance conferred by the Government of India. In 2010 alone the company has won more than ten awards initiated by the various nationally and internationally reputed organizations for its excellence in various aspects of business.

Table 5.1

Financial performance of Infosys Technologies

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. billions)	19.01	26.04	36.23	47.61	68.60	90.28	131.49	156.48	202.64	211.40
Sales growth (%)	-	36.99	39.14	31.42	44.08	31.61	45.65	19.01	29.50	4.32
Net earnings (in Rs. billions)	6.29	8.08	9.58	12.43	19.00	24.20	37.83	44.70	58.19	58.03
Earnings growth (%)	-	28.50	18.56	29.80	53.15	27.13	56.26	18.16	30.18	-0.27
Operating profit margin (%)	36.94	36.26	32.01	30.90	32.52	30.18	31.45	32.60	33.14	35.57
Net profit margin (%)	33.08	31.03	26.44	26.12	27.80	26.80	28.77	28.57	28.72	27.45
Return On Investment (%)	50.53	45.38	40.54	45.22	42.56	39.51	37.05	37.81	37.71	34.13
Return On Equity (%)	45.25	38.84	33.49	38.22	36.30	35.10	33.89	33.14	32.67	26.33
Reserves (in Rs. billions)	13.57	20.47	28.28	32.20	51.06	67.59	108.76	132.04	175.23	217.49
Debt Equity ratio (times)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current ratio (times)	3.49	3.87	3.92	1.67	2.80	2.75	4.96	3.30	4.71	4.28
Market price per share (Rs.)	4083.75	3748.60	4052.85	4938.2	2257.20	2981.40	2018.65	1439.90	1323.90	2615.95
Book value per share (Rs.)	52.51	78.58	108.00	122.10	194.00	250.00	195.40	235.80	310.90	384.69
Earnings Per Share (Rs.)	95.05	122.10	144.60	186.60	70.40	87.90	66.23	78.15	101.58	101.30
Dividend Per Share (Rs.)	10.00	20.00	27.00	129.50	11.50	45.00	11.5	33.25	23.50	25.00
Price Earnings ratio (times)	42.96	30.70	28.02	26.47	32.10	33.90	30.48	18.42	13.03	25.82
Price to Book ratio (times)	77.77	47.70	37.53	40.44	11.64	11.93	10.33	6.11	4.26	6.80
No. of shares (in Crores)	6.62	6.62	6.62	6.66	27.05	27.56	57.12	57.20	57.28	57.28
Dividend yield (%)	0.24	0.53	0.67	2.62	0.51	1.51	0.57	2.31	1.78	0.96

Source: Annual reports

The financial performance of Infosys Technologies Ltd during the period spanning from 2001 to 2010 is reported in Table 5.1. Both sales and earnings position of Infosys Technologies have grown terrifically regardless of the changes in the economic cycles in India and across the Globe. The company's large scale of operations has helped to offset the impact of global downturns and currency volatility. When sales moved up from Rs.19.01 billion in 2001 to Rs.211.40 billion in 2010, net earnings surged to Rs.6.29 billion in 2010, which is almost 9 times of its earnings in 2001. Such a trend in the sales and earnings position of Infosys Technologies really corroborates the usage of its name as an icon of the Information Technology industry of the country. The profit margins (operating and net) of Infosys Technologies over the years have reduced, albeit recent improvements. When operating margin slightly declined from 36.94 per cent (in 2001) to 35.57 per cent (in 2010), net profit margin decreased from 33.08 per cent to 27.45 per cent during the same period. This could be attributed to the increased employees cost to the firm. The lower operating profit margin and enhanced capital investment base have an unfavorable effect on the return on capital employed, which fell from 45.25 percent (in 2001) to 26.33 percent (in 2010). Similarly increased amount of retained earnings year by year pull down its rate of return on net worth also. In spite of such downward trend in the rates of return of Infosys, it is gratifying to note that the amount of its net earnings in 2010 is 9.5 times more than its earnings in 2001.

The long term solvency position of the company found sound as it has been running debt-free operations for more than a decade. Due to this shareholders might have barred from the benefits of trading on equity, but the credit standing of the company is very strong and its operational flexibility is not jeopardized. The emerging liquidity position of Infosys appears to be highly satisfactory. The current ratio has gone up from 3.5 to

4.7 times during the study period which gives an indication that the company is unlikely to encounter any difficulty in servicing the claims of its short term creditors.

All of the investment valuation ratios showed upward trend during the period of the study. The EPS has gone up from Rs. 95.05 in 2001 to Rs.101.30 in 2010 and such a growth is mesmerizing indeed on considering its 9 times expansion in number of shares during the period. Similarly dividend per share also has gone up from Rs.10 per share to Rs. 25 per share during the same period. When the book value of its share rose from Rs.52.1 per share to Rs.384.69 per share, the Price Earnings ratio consolidated its position from the high of 42.96 times to 25.82 times . Such a trend in book value and Price Earnings ratio is an indication of the more precise valuation of its shares by the market. The company has already issued bonus shares and holds promise of issuing more in future in terms of its reserve position at staggering figure of Rs.217.49 billion in 2010. From all these facts it can be reasonably concluded that the chances of increase in the market value of the shares of Infosys are very high. With the recovery in the world economy and growth in overall IT spends, the company's revenues are expected to record healthy growth in the years to come.

5.6.2: Wipro Ltd.

Wipro Limited (Wipro), together with its subsidiaries and associates (collectively, the company or the group), is one of the leading India based provider of IT Services and Products, including Business Process Outsourcing (BPO) Services, globally. The company operates in five reportable segments namely: global IT services and products (comprising IT Services and BPO Services segments); India and Asia Pacific IT services and products; consumer care and lighting; Healthcare and Life-Science and payers. Wipro is headquartered in Bangalore, India. Wipro Technologies is

a global services provider delivering technology-driven business solutions that meet the strategic objectives of clients.

Wipro Ltd was incorporated in the year 1945 at Karnataka by Azim H Premji who is promoter and chairman of the company. The company started as an edible oil producer and then transformed themselves in into leading player in Fast Moving Consumer Goods and IT services & Products business. Now the Wipro group's principal activity is to render information technology services. The services include integrated business, technology and process solutions including systems integration, package implementation, software application development and maintenance and transaction processing. These services also comprise of information technology consulting, personal computing and enterprise products, information technology infrastructure management and systems integration services. Wipro is the leader in providing IT solutions and solutions for the corporate segment in India.

In February 2001, the company became the first software technology and services company in India to be certified for ISO: 14001 certification for complying with the international standards for Environmental Management System (EMS) in three major software development and technology centers in Bangalore. The company received the BEST award from American society for training & development (ASTD) for three consecutive years 2004, 2005 and 2006. Many other National and International awards have also credited by Wipro so far for its outstanding performance in the industry.

Wipro has already signed partnership agreements with many corporate giants in various sectors across the globe. GE, Philips, Microsoft, Cisco systems, Arcelor Mittal etc. are some of the global partners of Wipro for synergizing its operations in specific areas.

Table 5.2

Financial performance of Wipro Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. billions)	30.57	34.25	39.92	51.35	72.33	102.27	136.84	174.93	215.07	229.22
Sales growth (%)	.	12.05	16.54	28.63	40.86	41.39	33.80	27.83	22.95	6.58
Net earnings (in Rs. billions)	6.66	8.66	8.13	9.15	14.95	20.2	28.42	30.63	29.74	48.98
Earnings growth (%)	.	30.03	-6.12	12.55	63.39	35.12	40.69	7.78	-2.91	64.69
Operating profit margin (%)	24.80	27.49	23.09	21.09	24.37	22.92	23.26	20.62	17.41	25.29
Net profit margin (%)	21.80	25.29	20.37	17.82	20.67	19.76	20.77	17.51	13.83	21.37
Return On Investment (%)	37.72	36.78	27.11	30.01	35.57	36.18	33.30	23.24	21.36	24.96
Return On Equity (%)	33.91	34.2	24.42	26.08	30.55	31.43	30.49	26.38	23.76	27.68
Reserves (in Rs. billions)	18.29	24.86	32.84	34.61	47.52	61.35	90.25	112.60	122.21	173.97
Debt Equity ratio (times)	0.02	0.01	0.02	0.03	0.01	0.01	0.03	0.33	0.40	0.31
Current ratio (times)	3.3	3.42	2.95	1.21	1.54	1.46	1.68	2.54	1.83	2.39
Market price per share (Rs.)	1338.4	1700.6	1233.5	1361.2	670.95	559.70	559.40	432.10	245.90	706.95
Book value per share (Rs.)	80.71	108.90	143.20	150.70	69.50	45.03	63.86	79.05	85.42	120.49
Earnings Per Share (Rs.)	28.59	37.26	34.97	39.31	21.3	14.17	19.48	20.96	20.30	33.36
Dividend Per Share (Rs.)	0.50	1.00	1.00	29.00	5.00	5.00	6.00	6.00	4.00	6.00
Price Earnings ratio (times)	46.81	45.64	35.27	34.63	31.6	39.5	28.72	20.62	12.11	21.19
Price to Book ratio (times)	16.58	15.62	8.61	9.03	9.65	12.43	8.76	5.47	2.88	5.87
No. of shares (in Crores)	23.24	23.25	23.26	23.28	70.36	142.58	145.90	146.15	146.50	146.82
Dividend yield (%)	0.04	0.06	0.08	2.13	0.75	0.89	1.07	1.39	1.63	0.85

Source: Annual reports

Table 5.2 unfolds the financial performance of Wipro Ltd. during the period 2001-2010. In the past the company recorded an impressive growth in its earnings fuelled by the strong demand for computer software and hardware from various parts of the globe. Net earnings of the company have increased consecutively till 2007-08. There was marginal rate of decrease in its earnings in 2008-09 which is mainly due to the contraction of its revenues from global markets resulted by the economic slowdown. But in 2009-2010, the company clocked terrific improvement in its sales growth and its net earnings jumped more than 60 percent of its just previous year earnings. Profit margins of the company are almost steady and constant during most of the years of study. Even though its net profit margin showed mild decline in certain years, by 2009-10 it reverted back to its origin level of 21percent. Similar is the trend in operating margin also. Rate of return (ROR) measures (on capital employed and net worth) have considerably declined during the study period. But decline in ROR on capital employed is much more than the reduction in ROR on net worth. Moreover, ROR on net worth of WIPRO is higher than the ROR on capital employed during the last 3 years of the study which might be the outcome of leverage financing employed by the company. Increase in capital employed shows that the company has good future plans for further expansion of its business.

The presence of debt content in the capital structure has largely increased during the last three financial years. However, still it is only about one –third of its total capitalization which indicates that the WIPRO's long term solvency position is much sound and even now it has ample scope for maximizing the earnings to its investors through further leveraging process. The liquidity position as measured by current ratio appears to be commendable during all the years under reference.

When the EPS has gone up from Rs. 28.59 per share in 2001 to Rs. 33.36 per share in 2010, the DPS has multiplied 12 times from Rs.0.5 per share to Rs.6 per share during the same period. Book value of share has rose from Rs.80.71 per share to Rs.120.49 per share. When such a growth in these investment parameters is reviewed in terms of the increased number of equity shares (through bonus issue, right issue and stock split), one should be more wondered about the profitability of investment in WIPRO's stock during the past. Price Earnings ratio of the company more than halved from 46.81 times in 2001 to 21.19 times in 2010, it is still higher than Price Earnings multiples of many of the forerunners in the industry and the premium in the valuation can be attributed to WIPRO's high growth prospects. Increase in net worth position indicates its stronger capital base and healthy asset quality. Bulging reserve base especially during the last 5 years signals the possibility of further free issues by WIPRO in future.

5.6.3 HCL Infosystems Ltd

HCL Infosystems Ltd is India's premier hardware, services and ICT systems Integration Company offering a wide spectrum of ICT products that includes Computing, Storage, Networking, Security, Telecom, Imaging and Retail. HCL is a one-stop-shop for all the ICT requirements of an organization. India's leading System Integration and Infrastructure Management Services Organization, HCL has specialized expertise across verticals including Telecom, BFSI, e-Governance and Power. HCL has India's largest distribution and retail network, taking to market a range of Digital Lifestyle products in alliances with leading global ICT brands, including Apple, Cisco, Ericsson, Kingston, Kodak, Konica Minolta, Microsoft, Nokia, Toshiba, and many more.

HCL Infosystems Ltd is one of the pioneers in the Indian IT market, with its origins in 1976. For over quarter of a century, it has developed and implemented solutions for multiple market segments, across a range of technologies in India. The company has been in the forefront in introducing new technologies and solutions. Now the company is in the process of implementing the IT Infrastructure part of the Pan Africa project, which connects 53 African countries into one network, providing electronic and knowledge connectivity to the African countries. HCL Info systems have been the recipient of many awards since its inception.

Sales revenue of HCL Infosystems has recorded robust growth over the years. In 2006-07 there was drastic upturn in sales position and sales during the year expanded 5 times of just previous period sales. But similar rate of growth could not be attained by the company in earnings. Operating margin has dipped from 7.69 per cent to 3.43 per cent and net profit margin from 5.37 per cent to 2.19 per cent during the study period. Such a trend in its profitability measures indicates that the increment in operating cost of the company is increasing at a rate much higher than the rate of growth in sales. So the management should evolve out fruitful cost management strategies.

Current ratio of HCL Info system has declined over the years. It fell from 2.12 to 1.58 times indicating relatively weaker liquidity position of the company. However the working capital position never went in to the negative zone so far. The company is using relatively lower proportion of debt in financing its assets and the trend in debt equity ratio causes no worry of financial risk to the investors. Comparatively higher rate of return on equity over rate of return on capital employed reveals that the investors are able to enjoy the advantage of trading on equity to an extent.

Table 5.3

Financial performance of HCL Info systems Ltd

Year ended 30th June	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. billions)	10.86	11.88	15.65	14.18	19.32	22.95	116.48	124.11	122.11	119.53
Sales growth (%)	-	9.42	31.70	-9.39	36.23	18.79	407.61	6.55	-1.62	-2.11
Net earnings (in Rs. Crores)	58.36	46.13	61.73	120.9	132.77	113.22	317.85	304.75	260.44	261.55
Earnings growth (%)	-	-20.96	33.82	95.85	9.82	-14.72	180.74	-4.12	-14.54	0.43
Operating profit margin (%)	7.69	6.25	5.25	10.12	8.15	6.39	3.91	3.85	3.40	3.43
Net profit margin (%)	5.40	3.88	3.94	8.53	6.87	4.93	2.73	2.46	2.13	2.19
Return On Investment (%)	20.44	16.33	18.99	30.54	30.44	24.16	42.10	35.19	30.54	16.86
Return On Equity (%)	19.70	14.11	19.09	30.57	30.70	27.72	37.73	30.38	22.99	13.60
Reserves (in Rs. billions)	18.29	14.46	19.35	36.76	7.94	6.71	18.79	17.81	15.21	18.61
Debt Equity ratio (times)	0.38	0.39	0.33	0.18	0.19	0.48	0.28	0.35	0.20	0.27
Current ratio (times)	2.12	1.87	1.60	1.35	1.71	1.63	1.46	1.58	1.47	1.58
Market price per share (Rs.)	83.95	120.50	80.35	663.75	806.05	183.00	129.70	161.00	76.05	136.00
Book value per share (Rs.)	92.83	102.43	101.33	120.20	25.86	24.20	49.79	58.61	66.14	87.26
Earnings Per Share (Rs.)	18.29	14.46	19.35	36.76	7.94	6.71	18.79	17.81	15.21	11.98
Dividend Per Share (Rs.)	7.00	2.50	10.99	21.00	6.20	8.00	8.00	8.00	6.50	7.50
Price Earnings ratio (times)	4.59	8.33	4.15	18.06	101.52	27.27	6.90	9.04	5.00	11.35
Price to Book ratio (times)	0.90	1.18	0.79	5.52	31.17	7.56	2.60	2.75	1.15	1.56
No. of shares (in Crores)	3.19	3.19	3.19	3.29	16.72	16.87	16.92	17.12	17.12	21.83
Dividend yield (%)	8.34	2.07	12.45	3.16	0.77	4.37	6.17	4.97	8.55	5.51

Source: Annual reports

The Price Earnings of the company has oscillated throughout the study period, which seems to be due to the general market conditions more than that of company fundamentals. On considering the increase in the number of shares issued by the company during the last 10 years, it can say that both EPS and DPS of HCL Info system has improved considerably and the effect of which truly reflected in its market value of share also. Growth in EPS has made it possible to pay dividend regularly to the investors of common stock.

5.6.4: MRO Tek Ltd.

In 1984, MRO-Tek started with the initial focus on network computing with indigenously developed Line Drivers and Modems. The company today is a leader in the networking and last mile access segment. The Engineering efforts at the manufacturing / R&D Facilities together with service network keep pace with technological advancement and customer expectations. MRO-TEK is headquartered in Bangalore the Silicon Valley of India with branches in Delhi and Mumbai. MRO-TEK has reached 400,000 miles of network connectivity.

MRO-TEK Ltd is mainly engaged in the business of providing Solutions and Services for Access to the Internet backbone, Data communications and Networking etc. Net access and Networking are among the fastest growing areas of business worldwide. The Company has recognized the Middle East and SAARC countries, which offers the biggest growth potential in networking market due to rapid advancements in wireless and Internet technologies.

Table 5.4

Financial performance of MRO Tek Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	118.63	72.85	85.29	99.14	116.42	150.70	123.96	149.19	138.16	81.41
Sales growth (%)	-	-38.59	17.08	16.24	17.43	29.45	-17.74	20.35	-7.39	-41.08
Net earnings (in Rs. crores)	18.24	6.94	3.24	5.23	4.27	17.56	10.72	15.58	3.31	-1.82
Earnings growth (%)	-	-61.95	-53.31	61.42	-18.36	311.24	-38.95	45.34	-78.75	-154.98
Operating profit margin (%)	26.70	15.68	6.38	5.80	6.36	16.78	12.41	14.53	3.35	-1.84
Net profit margin (%)	15.38	9.53	3.80	5.28	3.67	11.65	8.65	10.44	2.40	-2.24
Return On Investment (%)	39.16	15.36	6.92	7.32	8.68	30.05	16.68	23.19	4.52	-1.67
Return On Equity (%)	27.46	10.17	4.69	7.42	5.95	20.87	11.63	16.66	3.52	-2.03
Reserves (in Rs. crores)	56.20	58.02	58.87	60.25	61.60	73.94	81.81	84.00	84.48	80.30
Debt Equity ratio (times)	0.26	0.12	0.14	0.11	0.19	0.00	0.00	0.00	0.09	0.00
Current ratio (times)	3.58	3.05	3.01	2.64	2.44	2.24	2.63	2.02	3.18	3.83
Market price per share (Rs.)	24.95	16.75	13.00	12.05	34.55	79.45	82.15	63.85	19.05	32.20
Book value per share (Rs.)	32.51	33.40	33.82	34.49	35.15	41.19	44.44	49.24	49.49	47.97
Earnings Per Share (Rs.)	8.93	3.40	1.59	2.56	2.09	8.60	5.17	8.21	1.74	-0.98
Dividend Per Share (Rs.)	1.00	1.50	0.80	1.00	1.25	2.25	2.00	3.00	1.00	1.00
Price Earnings ratio (times)	2.79	4.93	8.18	4.71	16.53	9.24	15.89	7.78	10.95	-
Price to Book ratio (times)	0.77	0.50	0.38	0.35	0.98	1.93	1.85	1.30	0.38	0.67
No. of shares (in Crores)	2.04	2.04	2.04	2.04	2.04	2.04	2.07	1.90	1.90	1.87
Dividend yield (%)	8.02	8.96	6.15	8.30	3.62	2.83	2.43	4.70	5.25	1.25

Source: Annual reports

The annual financial data of MRO TEK for the period from 2001 to 2010 reported in Table 5.4 indicates that in addition to slower and erratic sales growth, the company is suffering from sagging profit margins. The adverse impact of the global economic recession on sales and earnings position of the company is clearly visible during the last two years. Its annual operating profit and net profit margins are shrinking year by year and both of these margins fall in to negative zone in 2009-2010. The dilution in operating earnings and the resultant effect on net profit position has brought in considerable reduction in rates of return on capital employed as well as on net worth. When return on capital employed declined from 39.16 per cent to a negative 1.67 per cent, return on net worth went down from 27.46 per cent to negative 2.23 per cent during the period observed.

The debt equity ratio showed a downward trend. It declined from 0.26 times (in 2001) to the zero level (in 2010). This implies that the company is relying more on its owner's equity to finance its assets rather than borrowings. Even if the profitability has declined during the study period, there will be no chance for bankruptcy of MRO TEK as its financial ratio (debt equity) reached the safest point of 'zero' in 2010. The trend persistent in the book value of share is also substantiating this fact. The short term liquidity position as measured by the current ratio shows that the company is consistently maintaining its current assets on an average three fold of its short term obligations. Even though such a trend in this ratio is guaranteeing its creditors to settle their claims in time, being a declining firm it could be viewed as slack management practices pursued by the company.

In order to sustain their continued commitment to the shareholders, and to retain the reputation of consistent dividend paying company, despite

reduction in revenue, or consequent losses incurred, MRO TEK has paid a dividend of 20 per cent (Re 1.00 per share) for the year 2009-10, out of carried-over surplus in Profit and Loss account. During the years 2007-08 and 2009-10 the Company implemented Scheme for buying back of its equity shares. The book value of the company remains within the range of Rs.40 to Rs.50 (during the last 5 years). Lowering price book ratio and relatively lower Price Earnings ratio all are indications of the investor worries as to the future prospects of the company.

5.6.5: Smartlink Network Systems Ltd.

Smartlink Network Systems Ltd was incorporated on 31st March 1993 under the Companies Act, 1956 as Smart-Link Network Private Limited with original registered office at Goa for setting up a manufacturing unit, and renamed as D-Link (India) Private Limited on 29th March 1995 and became deemed Public Limited Company as D-Link (India) Ltd. with effect from 1st July 1998. In 2008 the company was de-merged into two entities, as part of a restructuring programme. D-Link's businesses related to the structured cabling systems, Research and Development, manufacturing and service operations are consolidated in a separate company, called Smartlink Network Systems. D-Link India retains the name of the company, but became a trading company which is managing the business related to the sales and marketing of networking products manufactured by Smartlink Network Systems. The Group's principal activities are to manufacture and market networking and communication products. The products include Interface cards, switches, modems, transceivers, print servers, internet servers and routers. Its broadband products include cable modem, wireless products/security products and networking storage products. The Group operates only in India.

Table 5.5

Financial performance of Smartlink Network Systems Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	152.67	162.24	188.79	217.97	270.20	274.11	283.78	292.29	156.81	166.03
Sales growth (%)	-	6.27	16.36	15.46	23.94	1.47	3.53	3.00	-46.35	5.88
Net earnings (in Rs. crores)	18.79	18.21	22.13	31.38	28.62	23.21	21.93	28.53	6.93	17.86
Earnings growth (%)	-	-3.09	21.53	41.8	-8.8	-18.90	-5.51	30.10	-75.71	157.72
Operating profit margin (%)	14.71	13.20	13.39	16.52	13.59	10.69	9.37	13.06	4.05	14.35
Net profit margin (%)	12.31	11.22	11.72	14.40	10.59	8.47	7.73	9.76	4.42	10.76
Return On Investment (%)	22.82	18.59	19.30	22.98	18.04	13.22	11.49	13.43	4.58	11.14
Return On Equity (%)	22.76	21.65	21.85	26.12	22.96	16.60	13.90	17.95	4.19	14.87
Reserves (in Rs. crores)	34.88	91.94	108.65	130.60	148.00	164.60	179.47	200.88	139.69	148.81
Debt Equity ratio (times)	0.20	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Current ratio (times)	4.21	3.84	2.39	2.04	1.75	1.78	1.92	1.72	2.17	1.66
Market price per share (Rs.)	155.40*	82.10	46.40	173.20	118.85	117.20	70.65	71.55	37.85	42.35
Book value per share (Rs.)	86.30	32.64	38.21	45.51	51.39	56.85	61.82	68.95	48.56	51.59
Earnings Per Share (Rs.)	4.11	6.07	7.37	10.46	9.54	7.73	7.31	9.51	2.31	5.95
Dividend Per Share (Rs.)	3.25	1.00	1.60	2.80	3.20	2.00	2.00	2.00	1.00	2.50
Price Earnings ratio (times)	3.78	13.53	6.30	16.56	12.46	15.16	9.66	7.52	16.39	7.12
Price to Book ratio (times)	1.80	2.52	1.21	3.81	2.31	2.06	1.14	1.04	0.78	0.82
No. of shares issued (in lakhs)	45.71	30.05	30.05	30.05	30.05	30.05	30.05	30.05	30.05	30.05
Dividend yield (%)	2.09	1.22	3.45	1.62	2.69	1.71	2.83	2.80	2.64	5.90

Source: Annual reports

The financial ratios computed for assessing the financial performance of Smartlink Network Systems Ltd. is reported in Table 5.5. On interpreting these ratios it is very clear that the sales revenue of the company has increased consecutively from 2001 to 2008 and then the Global recession in 2009 reverted back its sales to the origin level. In 2010 qalthough some recovery in revenue position is seen, it could not be viewed as significant while looking in to the performance of its peers in the industry.

The net profit margin improved from 12.31 per cent in 2001 to 14.40 per cent in 2004 despite the fluctuations during the mid period. But it declined somewhat steeply over the subsequent 5 years before secured a relatively impressive margin of more than 10 per cent in 2010. But operating margin is constant in almost all years and slightly improved from 14.97 per cent in 2001 to 16.09 per cent in 2010. Comparison of trend in net profit margin and operating profit margin signals that, despite the company's effort to control its operating cost found fruitful, its non operating expenses are increasing year by year. Both rates of return on capital employed and on net worth almost halved during the reference period which pose a big question as to its ability to make productive use of capital employed in the business.

The short term liquidity position as read from the current ratio is deteriorating year by year. The current ratio steeply declined from 4.21 in 2001 to 1.66 in 2010, in spite of some improvement in 2009. But from the long term point of view, the company's solvency position is very strong as indicated by the trend in its debt equity ratio. For the last four years the

company has been zero debt in its capital structure, which could be viewed as real financial strength of the company.

All investment valuation ratios are focusing an oscillating position indicating the investor's lack of confidence or their concern about the growth and profitability of the company in future. The company has been paying dividend consistently over the years regardless of the fluctuations in EPS. Book value steadily increased from Rs.32.64 per share in 2002 to Rs. 68.95 per share in 2008, there after declined. When P/E ratio declined from 13.53 times to 7.12 times, the price to book value ratio shrank from 2.5 times to 0.82 during the period between 2002 and 2010.

5.6.6: Zenith Computers Ltd. (ZCL)

Zenith Computers, the second largest Personal Computer manufacturer in India, was Incorporated on 20th May 1980. The Company's object is to manufacture computers and micro processors based systems and peripherals by bringing the latest technology products thereby, creating a market in India for computing in offices, banks, households, education and every sector that has benefited from technological advancement. Its head office is located in Mumbai, with 15 branches all across India. Zenith produces desktop and laptop computers. On the worldwide front, Zenith PCs and Laptops are now available in US, South America, Europe, Middle East and Africa, SAARC and Asia.

Zenith launched laptops in India for the first time and introduced networking in India for the first time, and many others such as UNIX, CPM, touch screens and other innovations. It has marketing tie-ups with Texas Instruments, US, a Fortune-500 company for notebook computers and laser printers; with EICON, Canada, for open system communication and with

Interline, US, for networking. ZCL is the distributor for these companies in India. . It has also joined hands with IBM and Cabletron, both of the US, for distributing their products in India. It recently entered into a tie-up with Acer, US, for distributing its PCs.

Analysis of the financial data (Table 5.6) published by Zenith computers during the study period reveal that the sales revenue of the company increased considerably during the pre recession years (Rs.208.02 Crores in 2001 to Rs.324.32 Crores in 2007). During the last three recessions shattered years, it heavily declined. Earnings of the company showed an erratic up and down during this period. In fact it declined from Rs.2.17 Crores in 2001 to Rs.2.05 Crores in 2010. The trend in operating margin of the company is almost in parity with the trend in sales. But the contraction in net profit margin was more rigorous than that happened in sales, which can be attributed to the increased use of debt in capital structure. This capital component has been consuming a sizable portion of operating profit in the form of interest cost which made the net profit to become narrower. The reduction in earnings made significant impact on rates of return measures also. When return on capital employed almost halved during the period, the return on net worth at the end of the study period is almost same to that had earned in 2001. This could be due to the uniformity pursued by the company in maintaining its net worth position in accordance with operating conditions.

Table 5.6

Financial performance of Zenith Computers Ltd. (ZCL)

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	208.02	171.76	191.2	261.57	281.6	317.91	324.32	295.89	285.43	260.99
Sales growth (%)	-	-17.43	11.32	36.80	7.65	12.90	2.02	-8.77	-3.54	-8.56
Net earnings (in Rs. crores)	2.17	0.56	1.02	3.11	0.71	14.63	9.61	3.12	1.09	2.05
Earnings growth (%)	-	-74.19	82.14	204.90	-77.17	1960.56	-34.31	-67.53	-65.06	88.07
Operating profit margin (%)	4.73	3.34	2.14	3.31	3.61	7.76	9.44	9.27	5.36	3.84
Net profit margin (%)	1.04	0.32	0.53	1.18	1.67	4.60	2.96	1.05	0.38	0.79
Return On Investment (%)	10.37	6.17	3.70	7.57	7.95	19.66	12.20	8.26	3.36	4.61
Return On Equity (%)	5.14	1.30	2.32	6.60	8.79	22.30	19.00	6.07	2.28	4.84
Reserves (in Rs. crores)	26.72	27.27	28.40	31.52	38.08	50.08	35.07	35.83	29.94	26.86
Debt Equity ratio (times)	1.09	0.86	0.92	0.72	1.03	0.70	1.69	1.44	1.96	1.42
Current ratio (times)	12.91	13.20	16.15	6.68	3.71	6.21	3.85	3.52	3.69	2.49
Market price per share (Rs.)	16.8	20.25	5.85	20.75	20.30	94.80	54.35	28.85	14.1	23.35
Book value per share (Rs.)	27.27	27.63	28.36	30.37	34.61	42.36	32.62	33.11	30.84	27.36
Earnings Per Share (Rs.)	1.40	0.36	0.66	2.01	3.04	9.45	6.20	2.01	0.7	1.32
Dividend Per Share (Rs.)	1.20	0.00	0.00	0.00	1.00	1.50	1.50	1.20	0.90	0.90
Price Earnings ratio (times)	12.00	56.25	8.86	10.32	6.68	10.03	8.77	14.35	20.14	17.69
Price to Book ratio (times)	0.62	0.73	0.21	0.68	0.59	2.24	1.67	0.87	0.46	0.85
No. of shares (in lakhs)	154.81	154.81	154.81	154.81	154.80	154.81	154.81	154.81	154.81	154.81
Dividend yield (%)	7.14	0.00	0.00	0.00	4.93	1.58	2.76	4.16	6.38	3.85

Source: Annual reports

It can also be understood by the analysis that the long term solvency position of ZCL as measured by the debt equity ratio has been increasing year by year, even though it never crossed the generally accepted norm of 2. The trend in this solvency measure should be seriously look in to, especially under poor operating conditions, because the continuation of which bring damage not only to the shareholders, but also to the lenders. Short term solvency of the company found good throughout the period of the study.

All investment valuation ratios showed fluctuating trend during the study period. Earnings per Share increased from Rs.1.40 (in 2001) to its ever time high of Rs.9.45 (in 2007), then reverted back to its origin level in 2010. The company has paid dividend to its share holders consistently from the fiscal 2006 onwards. Actually in 2009 Zenith declared dividend at a rate which is higher than it's per share earnings. No considerable improvement is noticed in its book value of share, albeit some increase during mid years. Price Earnings ratio has gone up from 12 times to 17.69 times. One interesting point to be noticed here is that during the good earnings years, Zenith share has undervalued by the market as its Price to Earnings per share (P/E ratio) is relatively lower than the other years. But during recent recession hit financial years, its P/E ratio drastically moved up although it is due to the steep decline in its earnings. When we look in to the upward trend in this investment valuation measure along with its low price to book value position, it is reasonable to believe that the investor is still confident on future performance of the Zenith computers.

5.6.7: Rolta India Ltd.

Rolta India Limited (Rolta) is an Indian multinational organization in IT-based geospatial solutions, and caters to industries as diverse as

infrastructure, telecom, electric, airports, defense, homeland security, urban development, town planning and environmental protection. The Company was incorporated in 27th June of the year 1989 at Mumbai. The Company serves these markets by providing innovative solutions in Geospatial Information Systems (GIS), Engineering and Design Services (EDS) and Enterprise Information and Communications Technology (EICT), which includes Software Development, Advanced Security, Network Management, ERP Consulting and Business Intelligence. Rolta, through its joint venture with The Shaw Group Inc. USA – "Stone & Webster Rolta Ltd.", provides comprehensive Engineering, Procurement and Construction Management (EPCM) services to meet turnkey project requirements of power, oil, gas and petrochemical sectors. Rolta has executed projects in over 40 countries.

IBM India Ltd had entered in a strategic alliance with the company in the year of 2000 to pursue the e-business market in India and also to provide customized e-business solutions to domestic customers. During the year 2002, Rolta ranked amongst Forbes Global's 200 best companies in 2002 and it retains its position as in premier league. Rolta had launched, in partnership with Oracle-ERP services in the year 2006-07 to specialized markets like Utilities, Engineering Division and Oil etc. As a part of its systematic plan to move up the IT value chain, Rolta has made several strategic acquisitions during the last 2 to 3 years.

Table 5.7

Financial performance of Rolta India Ltd.

Year ended	Dec-01	June-03	June-04	June-05	June-06	June-07	June-08	June-09	June-10
Sales (in Rs. crores)	300.81	377.83	292.25	345.97	456.73	599.14	850.92	946.69	1170.44
Sales growth (%)	-	25.60	-22.65	18.38	32.01	31.18	42.02	11.25	23.63
Net earnings (in Rs. crores)	105.45	112.29	80.50	103.35	139.42	182.25	262.94	372.32	360.50
Earnings growth (%)	-	6.49	-28.31	28.39	34.90	30.72	44.27	41.60	-3.17
Operating profit margin (%)	57.4	61.75	52	47.26	51.62	49.35	50.62	57.54	57.12
Net profit margin (%)	34.98	29.65	27.25	29.18	30.17	29.99	29.49	37.23	30.80
Return On Investment (%)	25.56	22.14	13.83	18.35	16.65	11.59	15.31	16.31	14.14
Return On Equity (%)	29.22	24.86	15.77	19.61	13.63	15.89	20.16	22.88	18.93
Reserves (in Rs. crores)	297.21	387.95	446.85	463.46	942.69	1066.92	1143.11	1465.92	1743.13
Debt Equity ratio (times)	0.46	0.50	0.44	0.33	0	0.53	0.53	0.59	0.63
Current ratio (times)	3.3	6.08	5.05	3.36	3.52	6.57	3.27	3.34	3.32
Market price per share (Rs.)	111.05	73.45	63.65	126.05	148.05	467.3	246	126.05	167.95
Book value per share (Rs.)	56.66	70.91	80.16	82.76	127.96	143.17	81.05	101.05	118.14
Earnings Per Share (Rs.)	16.56	17.63	12.64	16.23	17.44	22.75	16.34	23.12	22.36
Dividend Per Share (Rs.)	3.00	3.00	3.00	3.50	4.00	5.00	3.00	3.00	3.25
Price Earnings ratio (times)	6.71	4.17	5.03	5.09	8.49	20.71	15.05	5.45	7.51
Price to Book ratio (times)	1.96	1.04	0.79	1.52	1.16	3.26	3.04	1.25	7.51
No. of shares (in lakhs)	636.93	636.93	636.93	636.93	799.18	801.19	1,608.98	1,610.07	1611.95
Dividend yield (%)	2.70	4.08	4.71	2.78	2.70	1.07	1.22	2.38	1.94

Source: Annual reports

From the analysis of Table 5.7 it came to know that sales and net earnings of Rolta Ltd received impressive growth during the period under reference. It achieved double digit growth in earnings in most of the years. All profit margins improved significantly and the rates of return measures (return on equity and return on capital employed) followed the patterns of net profit margins.

The financial solvency position as revealed by the debt equity ratio is found constant and is in the region of 0.5. Such a relatively low proportion of debt in the capitalization indicates sufficient scope for the company to make better advantage of financial leverage there by enhanced value to the firm. The current ratio is always above the standard indicating its sound liquidity position.

It is also observed that EPS of Rolta has been increasing and maintaining almost constant dividend payout assuring fixed income to the investors. Market value of the shares tripled in 2006-07 when the Indian stock market soared in that year, and then the growth corrected to the original level in subsequent years. Even with the EPS of Rolta has increased over the years, the trend in the value of its stock in the market is much indifferent to this increase and as a result P/E ratio has widely fluctuated. However the growth in the market value of the stock at fixed intervals and the increasing trend in book value all are indicators of the strong fundamentals and the resultant investor confidence with regard to the growth prospects of the company.

5.6.8: KPIT Cummins Infosystems Ltd.

KPIT Cummins was incorporated in 1990 as KPIT Infosystems Ltd (KPIT). In 2002-03 (refers to financial year, April 1 to March 31), Cummins

Infotech Ltd merged with KPIT. Consequent to the merger, the company got its present name. KPIT Cummins offers solutions primarily to the automotive, transportation and manufacturing, energy and utilities, and defense and government verticals through its integrated enterprise solutions, auto and allied engineering, semi conductor solutions group, and SAP business units.

KPIT Cummins provides technology solutions to global clients, in the areas of Advanced Technology Solutions (ATS), Enterprise IT and Business / Knowledge Process Outsourcing (BPO /KPO) across the Manufacturing and Diversified Financial Services (DFS) industry verticals. The company geographically stretches in US, UK, Germany, France, Poland, India, Japan, South Africa and Korea.

KPIT Cummins had attained Microsoft Gold Certification status in April of the year 2007 with competencies in Custom Development and Microsoft Business Solutions. The company made a strategic alliance with Gemstone Systems in August of the year 2008 to offer High Performance Computing (HPC) and Cluster Management solutions to global corporations across US, India, Japan and Europe. It has entered into a definitive agreement to acquire US based CPG Solutions, a provider of premium Oracle Consulting services to manufacturing and supply chain companies. KPIT Cummins is highly focused on the Manufacturing and Energy and Utilities industries, which account for 85per cent of its revenues and these takeovers further improve its earning profile which is the major rationale behind its corporate acquisitions.

Table 5.8

Financial performance of KPIT Cummins Infosystems Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	39.1	47.84	72.51	122.98	193.2	257.72	317.21	463.35	644.18	427.04
Sales growth (%)	-	22.35	51.57	69.60	57.08	33.41	23.08	46.07	39.03	-33.71
Net earnings (in Rs. crores)	3.42	1.98	6.79	12.60	22.67	27.02	45.74	64.08	62.77	78.45
Earnings growth (%)	-	-42.11	242.93	85.57	79.92	19.19	59.28	40.10	-2.04	24.98
Operating profit margin (%)	11.82	9.95	19.77	20.52	19.82	16.37	20.98	24.96	16.84	14.33
Net profit margin (%)	8.75	5.06	14.19	17.38	18.43	13.99	17.75	20.20	13.55	12.18
Return On Investment (%)	15.67	11.76	21.23	20.01	16.53	13.87	17.13	21.88	26.89	18.49
Return On Equity (%)	14.67	7.91	18.29	26.39	20.53	19.23	23.68	23.28	36.58	20.20
Reserves (in Rs. crores)	18.16	19.88	29.32	39.94	98.95	130.65	175.68	256.93	155.00	370.99
Debt Equity ratio (times)	0.26	0.32	0.20	0.56	0.33	0.62	0.63	0.31	0.69	.29
Current ratio (times)	5.07	4.72	4.39	5.11	4.98	4.27	2.57	3.08	1.23	2.47
Market price per share (Rs.)	27.80	122.00	139.80	216.55	301.50	393.00	131.15	78.40	25.60	115.60
Book value per share (Rs.)	45.16	48.49	59.96	78.07	75.23	94.73	25.49	34.99	21.99	49.25
Earnings Per Share (Rs.)	6.62	3.83	11.58	21.47	16.09	18.56	6.12	8.23	8.04	9.99
Dividend Per Share (Rs.)	0.75	0.50	1.75	2.00	1.75	1.75	0.70	0.70	0.60	0.70
Price Earnings ratio (times)	4.20	31.85	12.07	10.09	18.74	21.17	21.43	9.53	3.18	11.57
Price to Book ratio (times)	0.62	2.52	2.33	2.77	4.01	4.15	5.15	2.24	1.16	2.35
No. of shares (in lakhs)	51.64	51.64	58.68	58.68	140.9	145.6	747.76	778.83	780.43	785.23
Dividend yield (%)	2.70	0.41	1.25	0.92	0.58	0.45	0.53	0.89	2.34	0.61

Source: Annual reports

The appraisal of financial position of KPIT Cummins Infosystem is explained with the help of Table 5.8. The revenue from the sales operations of the company were in upturn (Rs.39.1 Crores to Rs.644.18 Crores) consistently from the fiscal 2001 to 2009. But in 2010 the revenue dropped in to Rs.427.04 Crores. Although the company lost about 34 per cent of its sales revenue during that year compared to the previous year, effective cost control measures initiated by the company has improved its profit position by bringing about 25 per cent growth in its net earnings to share holders. Both operating profit margin and net profit margin of the company over the years have increased and its growth is really amazing. When operating margin increased from 14.19 per cent (in 2001) to 24.96 per cent (in 2008), its net profit margin has more than doubled from 8.75 per cent to 20.20 per cent during the same period. But next two years significant contraction happened to these profitability measures. Higher operating profit margin has made significant impact on the rate of return on capital employed which come up to 26.89 percent in 2009 from 15.67 per cent in 2001. But in 2010 it declined to 16.12 per cent. The same trend is perceived with respect to return on net worth also. Return on net worth of the company surged from 14.67 per cent to 36.58 per cent before it dropped in to 20.20 per cent in 2010.

The solvency position of KPIT Cummins is found sound due to two reasons. First, its operating profit margin increased throughout the period and so it is not likely to commit default in payment of interest to its lenders. Secondly, its debt equity ratio over the years has been fluctuating only within the range of 0.20 to 0.69 and substantially improved during the last year. None of the years it reached even at 1:1 ratio. The short term liquidity position of the company can be considered satisfactory. It is true that the

current ratio has gone down to 2.47 in 2010 from 5.07 in 2001, yet it is still higher than the standard norm of 2. The decrease in current ratio of the company might be due to the practice of the company to use its internally generated savings in financing acquisition of fixed assets.

By taking into account the multiplicity of equity shares, it can be said that all investment parameters of KPIT Cummins stock have been in upward trend for the last few years. The company has declared dividend almost at consistent rate (even though it is marginal). It is rational to believe that the KPIT Cummins's business risk profile remains stable on the back of an enhanced service mix and improving operating efficiency. Lower gearing in its capital structure signaling sound financial risk profile, its strong liquidity position and improving operating profit margin supported by healthy industry prospects shall make the investors more positive about the investments in the stocks of KPIT Cummins.

5.6.9: Infotech Enterprises Ltd.

Infotech Enterprises, one of the largest global engineering solutions companies with 8000+ associates across 30 global locations, is specialized in product development, lifecycle support, engineering software, network engineering and content management & transformation services with deep domain expertise in industries such as Aerospace, Rail Transportation, Heavy Engineering, Semiconductors, Telecom, Utilities and Energy. Publicly quoted (and have enjoyed equity participation from several globally reputed investors) and headquartered out of Hyderabad, India, they have presence across North America, Europe, Middle East and Asia Pacific regions.

Conceived with a mission to "Integrate technology and talent for the 1990s and beyond," Infotech was formed in 1991. Infotech is now globally recognized as one of the foremost players in Engineering Design, Geographic Information and IT services. Infotech was among the first Indian software services companies to make successful acquisitions in Europe; they acquired companies in the UK and Germany, created a fully owned subsidiary in the US, and instituted the concept of "offshore services with onshore responsibility" for their customers.

From the financial performance indicators reported in Table 5.9 it is understood that despite the impressive growth in sales, Infotech's profitability both in terms of sales and capital employed declined during the period of the study. When operating margin declined from 35.92 per cent in 2001 to 26.76 per cent in 2010, its net profit margin shrank from 29.95 per cent to 22.56 per cent during the same period. However, these two profitability indicators are much better than many of its peers in the industry. The rates of return measures (return on equity and return on capital employed) almost followed the same pattern of net profit margin. The company retains about 85 percent of its earnings and made a return on capital employed of 22.56 per cent even during the facet of financial crisis.

The company depends on owners funds to finance its expanding activities. The level of long term debt is meager and in most of the years including the end of the study period it is zero. So from the owner's point of view there is no financial risk to them, but it is at the opportunity cost of trading on equity. The liquidity position of Infotech enterprises is much strong. Although some fluctuations observed in its current ratio during certain years, it never falls below the standard norm of 2:1 during the study period.

Table 5.9

Financial performance of Infotech Enterprises Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	57.52	97.44	122.31	124.54	153.8	213.69	344.61	435.19	566.57	561.80
Sales growth (%)	-	41.96	35.83	23.67	25.13	22.53	25.68	20.66	23.86	26.76
Net earnings (in Rs. crores)	17.23	25.63	26.66	12.21	22.31	28.38	65.05	58.56	70.86	126.76
Earnings growth (%)	-	48.75	4.02	-54.20	82.72	27.21	129.21	-9.98	21.00	78.89
Operating profit margin (%)	35.92	41.96	35.83	23.67	25.13	22.53	25.68	20.66	23.86	26.76
Net profit margin (%)	29.95	26.30	21.80	9.80	14.51	13.28	18.88	13.46	12.51	22.56
Return On Investment (%)	22.01	22.67	19.16	8.13	12.88	13.54	22.67	9.26	10.50	15.83
Return On Equity (%)	27.56	21.81	18.72	7.98	12.83	13.41	23.79	9.36	10.27	15.76
Reserves (in Rs. crores)	56.4	110.32	127.91	138.44	159.15	196.36	250.31	501.50	662.29	776.09
Debt Equity ratio (times)	0.27	0.12	0.00	0.00	0.00	0.00	0.06	0.06	0.03	0.00
Current ratio (times)	2.38	4.01	4.00	4.17	3.05	3.00	2.79	3.47	3.21	2.63
Market price per share (Rs.)	67.05	590.7	89.75	111.4	277.15	526.5	361.8	279.7	85	368.85
Book value per share (Rs.)	102.15	163.2	98.4	104.94	118.07	139.02	59.23	101.2	124.91	144.84
Earnings Per Share (Rs.)	28.15	35.59	18.42	8.37	15.15	18.65	14.09	11.17	12.83	22.84
Dividend Per Share (Rs.)	2.2	2.4	1.25	1.25	1.5	2.25	1.13	1.2	1.5	2.00
Price Earnings ratio (times)	23.80	16.60	4.87	13.30	18.29	28.20	25.68	25.04	6.63	16.14
Price to Book ratio (times)	0.66	3.62	0.91	1.06	2.35	3.79	6.11	2.76	0.68	2.55
No. of shares (in lakhs)	61.21	72.01	144.70	145.81	147.27	152.19	461.54	521.28	552.30	555.00
Dividend yield (%)	3.28	0.41	1.39	1.12	0.54	0.43	0.31	0.43	1.76	0.54

Source: Annual reports

Both Earning per Share and Dividend per Share of the company have grown significantly given the growth in number of shares during the period under reference. Similar is the case of its book value of share also. The Price Earnings ratio increased steadily especially during five consecutive years just preceding to the recession years which indicates investor optimism about the growth prospects of the company in terms of its future earnings and market performance of its stock.

5.6.10: Aftek Ltd.

Aftek is an India based software development and embedded hardware manufacturing company, incorporated on March 25, 1986, as Aftek Business Machines Pvt Ltd. The company is started with a strong desire and passion to contribute to the Information Technology demand in the domestic market. In October 1994, the company became a public limited company. After 1995, the company through its acquisition strategy started offering complete product engineering services outside India to US and Europe. Then, the company has changed their focus from manufacturing of PCs and other products to software exports, special products and solution provider.

Service spectrum of Aftek covers key services such as application development, application maintenance, hardware development, firmware development, embedded systems and testing services. In order to position themselves aggressively in the US and global markets, Aftek has entered in to strategic alliances with some globally successful companies. Aftek has taken 49 percent stake in Munich based Arexera Information Technologies GmbH with a view to use this German presence to increase its European business.

The financial performance of Aftek Ltd. is explained with the help of the accounting ratios exhibited in Table 5.10. When the sales of Aftek have increased 7 to 8 times during the period between 2001- 2008, its earning position spanned more than 3 times during the same period. But the company suffered a net loss of Rs.12.77 Crores for the fiscal 2009 which is on account of 44 per cent drop in its sales compared to the previous year. However during better earnings years, the company is able to maintain thriving operating margins. The rate of return on capital employed and the rate of return on net worth is relatively good, but the gap between the two has widened especially during the last 5 years and there seems to be large amount of non operating expenses has been incurred by the company during the last two years. Return on equity has been steadily declining from 24.72 per cent in 2002 to a negative rate of 2 per cent in 2009. But the revival could be seen in 2010. The low and falling price book value ratio and falling price earnings ratio especially during the last 5 years indicate that investors are less and less optimistic about the firms' future profitability. However, on considering some of the fundamentals it could be inferred that the stocks of Aftek somewhat undervalued by the market, so the investment in which can be beneficial to investors.

Table 5.10

Financial performance of Aftek Ltd.

Year ended 30th June	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	45.41	61.55	96.29	138.94	195.25	193.29	332.52	392.54	220.35	182.03
Sales growth (%)	-	35.54	56.44	44.29	40.53	-1.00	72.03	18.05	-43.87	-17.39
Net earnings (in Rs. crores)	25.1	33.67	40.08	47.31	59.8	67.39	90.5	80.94	-12.77	0.28
Earnings growth (%)	-	34.14	19.04	18.04	26.40	12.69	34.29	-10.56	-115.78	102.19
Operating profit margin (%)	48.55	49.33	52.96	44.84	45.97	37.7	32.32	32.74	36.36	66.87
Net profit margin (%)	50.59	51.96	40.34	33.59	30.13	34.24	26.61	20.36	-5.65	00.15
Return On Investment (%)	26.13	26.39	18.17	17.28	13.38	6.41	12.16	9.91	9.33	20.75
Return On Equity (%)	24.72	25.50	16.80	16.89	18.13	13.88	15.55	12.43	-2.01	0.04
Reserves (in Rs. crores)	95.52	126.04	228.58	270.18	313.41	463.5	563.32	632.46	617.12	615.46
Debt Equity ratio (times)	0	0	0	0	0.39	0.11	0.07	0.12	0.14	0.18
Current ratio (times)	12.44	17.99	7.94	19.42	16.35	11.65	13.34	9.53	13.28	9.67
Market price per share (Rs.)	154.50	473.35	143.60	56.50	77.80	77.55	65.60	43.05	7.45	16.65
Book value per share (Rs.)	169.17	220.04	238.58	56.04	43.79	56.07	66.55	69.65	67.98	67.8
Earnings Per Share (Rs.)	41.83	56.11	40.08	9.46	7.97	7.86	10.37	8.66	-1.37	0.03
Dividend Per Share (Rs.)	2.5	3.5	5.00	1.00	1.00	1.00	1.00	0.50	0.00	0.00
Price Earnings ratio (times)	3.69	8.44	3.58	5.97	3.98	9.99	6.33	4.97	-	555.00
Price to Book ratio (times)	0.91	2.15	0.61	1.01	1.78	1.38	0.99	0.62	0.11	0.25
No. of shares (in lakhs)	60.01	60.01	100.00	500.00	750.00	857.17	872.65	934.86	935.31	935.31
Dividend yield (%)	1.62	0.74	3.48	1.77	1.29	1.29	1.52	1.16	0.00	0.00

Source: Annual reports

Long term solvency as measured by the debt equity ratio of the company is very strong. Initially the company has debtless capital structure, but later 2005 onwards the company has started to raise funds from borrowing sources to finance its investments in business. However the relative proportion of debt in its capital structure is very low on account of which its investors assume lower amount of financial risk. Short term liquidity of the company is sound as its current ratio is above the standard throughout the study period.

The Earnings per Share of the company has improved much and its growth is really fantastic compared to some of its peers in the industry. The company has paid dividend in all the years in which it was able to make profit even if the dividend payout is low.

5.6.11: Onward Technologies Ltd.

Onward Technologies Ltd. (OTL) is an ISO 9001-2000 certified company serving customers in the areas of Engineering Design Services, IT Services and IT driven Banking Products & Financial Services. The company mostly works on Banking Software Solutions Division (BSSD), Mechanical Software Solutions Division (MSSD), Process Software Solutions Division (PSSD) and Software Development Service Division (SDSD). Onward's global offices are spread across the USA, the UK, Germany, Finland, Netherlands, Japan, Singapore and India. The Company is headquartered in India and its business development centers are located at Mumbai and Pune.

Onward Technologies provides software development and technology expertise to leading firms on both a local and global scale. Onward's global clients include fortune 1000 companies in the IT Consultancy, Automotive, Agricultural, Heavy Engineering, Electrical Equipments and Aerospace Industry.

Onward Technologies is still passing through a difficult situation, even with the slight improvement compared to the mid years during the period under reference. Contraction of its revenue and consecutive losses diluted its net worth position considerably and compel the company to add further debt to its capital structure. Such practice made its book value in 2010 about 85 percent less than its value in 2001. Increasing rate of debt in its capital structure that is during poor operating conditions made its solvency position more vulnerable which sometimes forced the company to service its debt out of net worth.

Earnings per Share terribly declined from Rs. 10.55 per share in 2001 to the loss per share of 2.73 during the period of the study. Owing to the huge reduction earnings the prices of its stock in the market has wildly fluctuated. The company has not paid any dividend to its investors so far. Declining trend in its P/E ratio is an indication of losing investor confidence on growth potential of the company.

Table 5.11

Financial performance of Onward Technologies Ltd.

Year ended 30th June	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	45.41	61.55	96.29	138.94	195.25	193.29	332.52	392.54	220.35	182.03
Sales growth (%)	-	35.54	56.44	44.29	40.53	-1.00	72.03	18.05	-43.87	-17.39
Net earnings (in Rs. crores)	25.1	33.67	40.08	47.31	59.8	67.39	90.5	80.94	-12.77	0.28
Earnings growth (%)	-	34.14	19.04	18.04	26.40	12.69	34.29	-10.56	-115.78	102.19
Operating profit margin (%)	48.55	49.33	52.96	44.84	45.97	37.7	32.32	32.74	36.36	66.87
Net profit margin (%)	50.59	51.96	40.34	33.59	30.13	34.24	26.61	20.36	-5.65	00.15
Return On Investment (%)	26.13	26.39	18.17	17.28	13.38	6.41	12.16	9.91	9.33	20.75
Return On Equity (%)	24.72	25.50	16.80	16.89	18.13	13.88	15.55	12.43	-2.01	0.04
Reserves (in Rs. crores)	95.52	126.04	228.58	270.18	313.41	463.5	563.32	632.46	617.12	615.46
Debt Equity ratio (times)	0.00	0.00	0.00	0.00	0.39	0.11	0.07	0.12	0.14	0.18
Current ratio (times)	12.44	17.99	7.94	19.42	16.35	11.65	13.34	9.53	13.28	9.67
Market price per share (Rs.)	154.50	473.35	143.60	56.50	77.80	77.55	65.60	43.05	7.45	16.65
Book value per share (Rs.)	169.17	220.04	238.58	56.04	43.79	56.07	66.55	69.65	67.98	67.8
Earnings Per Share (Rs.)	41.83	56.11	40.08	9.46	7.97	7.86	10.37	8.66	-1.37	0.03
Dividend Per Share (Rs.)	2.5	3.5	5.00	1.00	1.00	1.00	1.00	0.50	0.00	0.00
Price Earnings ratio (times)	3.69	8.44	3.58	5.97	3.98	9.99	6.33	4.97	-	555.00
Price to Book ratio (times)	0.91	2.15	0.61	1.01	1.78	1.38	0.99	0.62	0.11	0.25
No. of shares (in lakhs)	60.01	60.01	100.00	500.00	750.00	857.17	872.65	934.86	935.31	935.31
Dividend yield (%)	1.62	0.74	3.48	1.77	1.29	1.29	1.52	1.16	0.00	0.00

Source: Annual reports

5.6.12: Kale consultants Ltd.

Kale Consultants Limited is a leading solutions provider to the global Airline, Airports, Logistics and Travel (AALT) industry. Committed to innovation and excellence, Kale delivers world-class software products, technology, managed process, hosting and consulting services. Kale with their talented professionals focus on delivering quality service to over 120 satisfied customers across five continents.

Kale Consultants (KCL) was incorporated as Private Ltd company on 25th September, 1986 and subsequently became a deemed public limited company on 29th October, 1997. Kale Consultants is now an ISO 9001 certified company, providing a range of application software products and related software services. The company apart for Airlines specializes in solution for Banking and Healthcare industries also.

Kale Consultants is known for its innovation and its 'first' - First on-line real-time Hospital management System, First Indian 'shrink wrapped' product for Banking, First Indian company to offer products for the airline industry and so on. Having created a sound foundation in the home market, kale has embarked on a mission to globalize its business. Towards this, the company has set-up offices/subsidiaries in major markets like USA and Australia. Kale has received the Corporate Award for Excellence in Gender Inclusivity by NASSCOM in India for the year 2010 as the Best Company with less than 1000 employees.

Table 5.12

Financial performance of Kale Consultants Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	34.6	49.53	49.95	46.36	49.29	62.58	79.51	86.19	102.62	126.73
Sales growth (%)	...	43.15	0.85	-7.19	6.32	26.96	27.05	8.40	19.06	23.49
Net earnings (in Rs. crores)	-6.73	2.03	3.14	3.19	0.75	6.48	8.05	16.63	10.13	19.14
Earnings growth (%)	-	-130.16	54.68	1.59	-76.49	764.00	24.23	106.58	-39.09	88.94
Operating profit margin (%)	2.16	18.61	20.28	19.92	22.9	27.09	24.51	22.01	20.83	26.08
Net profit margin (%)	-19.34	4.05	6.24	6.71	1.48	10.21	9.95	19.06	9.78	15.10
Return On Investment (%)	-9.23	5.26	6.10	5.20	2.65	10.88	11.98	19.60	11.87	17.53
Return On Equity (%)	-13.45	3.92	5.80	5.74	1.39	10.30	11.56	19.57	10.85	17.04
Reserves (in Rs. crores)	38.52	40.35	42.62	43.67	42.08	50.08	56.4	71.64	80.00	97.74
Debt Equity ratio (times)	0.16	0.17	0.18	0.27	0.31	0.19	0.15	0.08	0.03	0.04
Current ratio (times)	2.38	2.43	3.05	3.80	1.91	2.34	2.27	3.15	2.23	2.48
Market price per share (Rs.)	39.3	66.15	23.05	32.70	77.10	94.35	91.95	43.5	24.15	88.00
Book value per share (Rs.)	43.50	45.09	47.06	47.65	46.02	48.99	52.67	63.66	69.87	80.76
Earnings Per Share (Rs.)	-5.85	1.76	2.73	2.75	0.64	5.05	6.09	12.46	7.58	13.86
Dividend Per Share (Rs.)	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.75	1.00	2.00
Price Earnings ratio (times)	-6.72	37.59	8.44	11.89	120.47	18.68	15.10	3.49	3.19	6.35
Price to Book ratio (times)	0.90	1.47	0.49	0.69	1.68	1.93	1.75	0.68	0.35	1.09
No. of shares (in lakhs)	115	115	115	115.99	116.82	128.45	132.2	133.5	133.61	138.14
Dividend yield (%)	0.00	0.00	0.00	0.00	0.00	1.32	1.36	1.72	4.14	2.27

Source: Annual reports

From Table 5.12 it came to know that the profit margins (both operating and net) of Kale consultants have gone up during the period of the study. When net profit margin increased from negative rate of (19.34) per cent in 2001 to a reasonably attractive rate of 9.78 in 2009, its operating margin has made tremendous growth from 2.16 percent to an unbelievable rate of 20.83 per cent during the same period. The surging profit margins have brought in favorable effect on both rates of return measures. The return on capital employed rose from 1.28 per cent to 17.53 percent and the return on equity grew from a negative rate of 13.45 per cent to 17.04 per cent during the period. It is gratifying to note that the growth of these return measures really amazing during the last 5 years. On analyzing the trend there seems to be a potential for further improvement in these return measures through the enhancement of its operating efficiency.

From the point of view of long term solvency, its position appears to be very satisfactory. The presence of debt in the capital structure is marginal and it is keeping diminishing trend especially during recent years. The firm's net worth position is showing a consistent upward trend and due to these the debt equity ratio becomes almost equal to zero. The liquidity ratio indicates that the company has strong current asset base to meet the needs of its short-term creditors in time.

Book value of its share has grown consistently throughout the period. It increased from Rs.43.5 per share in 2001 to Rs.80.76 in 2010. Earnings per Share has increased and company has made regular payment of dividend (although it is marginal) particularly during the last few years. When we read out the improved earning fundamentals along with the lower price earning and price to book value ratios, it is reasonable to expect that the

stock of kale consultants is undervalued by the market at present and once the investor confidence revive through better financial results the return to its investors in the form of capital gain will be high.

5.6.13: KLG Systel Ltd.

KLG Systel is a knowledge company that has been an enabler in the burgeoning growth of Indian Industry and Infrastructure, providing support and IT enablement to Top 500 Indian companies (both from the government and private sector) and the Indian arms of Fortune 500 companies. It provides IT solutions for process, power, infrastructure, oil & gas, manufacturing, metals, heavy engineering and transportations. Incorporated as KLG Consultants Pvt Ltd on 2nd December 1985, the technology solutions offered by KLG Systel align with the different stages of the 'life cycle' of any large organization. Commercial operations of the company commenced during the year 1987-88. KLG Systel was converted into a public limited company in January 1994. It acquired its present name in the month of September of the same year 1994.

The business of KLG Systel is divided into Strategic Business Units (SBUs) under the heads of Business Life Cycle Solutions and Power System Solutions to enable it to cater to the specific functional and strategic needs of the industry. With its unique business model, the company has incorporated cutting-edge technologies from leading international technology partners such as Auto Desk, COADE, Microsoft, Oracle, , IBM, and SAP to provide business life cycle solutions to a wide spectrum of clients. These SBUs are structured in such a manner that they are able to leverage on each other's technology building blocks which in turn helps it to optimize utilization of technical resources and leveraging complementary technology to a customer's advantage. The company aligns its business strategies with the fundamental economic and growth trends in the country.

Table 5.13

Financial performance of KLG Systel Ltd.

Year ended 31st March	*2000	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	14.68	25.3	25.42	37.99	35.14	48.42	112.53	268.14	228.36	235.94
Sales growth (%)	-	72.34	0.47	49.45	-7.50	37.79	132.40	138.28	-14.84	3.32
Net earnings (in Rs. crores)	6.52	0.82	0.95	2.49	2.54	5.2	21.95	52.37	33.3	19.82
Earnings growth (%)	-	-89.88	15.85	162.11	2.01	104.72	322.12	138.59	-36.41	-40.48
Operating profit margin (%)	23.30	13.27	9.38	16.06	17.31	23.36	32.09	31.27	31.73	27.17
Net profit margin (%)	33.39	3.01	3.59	6.41	6.92	10.51	19.19	19.35	14.47	8.40
Return On Investment (%)	11.03	6.33	2.19	9.92	9.69	15.07	14.21	26.20	12.84	10.67
Return On Equity (%)	15.78	2.12	2.43	6.09	5.94	10.72	20.32	28.34	13.87	7.62
Reserves (in Rs. crores)	37.45	34.72	35.13	36.97	38.85	40.36	94.40	169.79	227.39	247.33
Debt Equity ratio (times)	0.00	0.02	0.02	0.02	0.01	0.15	1.09	0.61	0.84	1.00
Current ratio (times)	7.37	2.30	3.01	2.80	1.98	2.04	5.31	2.15	4.44	4.24
Market price per share (Rs.)	116.8	51.75	20.59	26.81	15.85	24.02	67.36	198.84	13.47	28.03
Book value per share (Rs.)	108.42	100.61	101.68	106.48	111.39	60.05	97.60	155.13	190.16	204.74
Earnings Per Share (Rs.)	17.12	2.13	2.48	6.50	6.62	6.44	20.35	44.75	26.37	15.60
Dividend Per Share (Rs.)	1.50	1.75	1.25	1.50	1.50	1.50	2.50	2.75	2.75	0.50
Price Earnings ratio (times)	6.82	24.30	8.30	4.12	2.39	3.73	3.31	4.44	0.51	1.80
Price to Book ratio (times)	1.08	0.51	0.20	0.25	0.14	0.40	0.69	1.28	0.07	0.14
No. of shares (in lakhs)	38.11	38.38	38.38	38.38	38.38	80.75	107.83	117.04	126.25	127.04
Dividend yield (%)	1.28	3.38	6.07	5.59	9.46	6.24	3.71	1.38	20.42	1.78

Source: Annual reports   *Year ended December

Analysis of Table 5.13 reveals that both sales revenue and earnings of KLG Systel has expanded over the years. Operating margin of the company has been at a significant rate of more than 30 percent and its profit margin within the range of 14 to 19 per cent during the last few years of the study. Return on net worth has increased steadily from 2.2 per cent in 2002 to 28.34 per cent in 2008. Increasing time trend in the company's rate of return on equity must be because of appropriate use of financial leverage. From 2007 onwards return on net worth is higher than return on capital employed which is exactly due to the presence of huge fixed interest bearing funds in the capital structure of the company. But the investors have to bear high degree of financial risk and its severity was high during the recession days. In 2009 and 2010 the rate of return on net worth of the company diminished at a rate which is much higher than the rate at which its return on capital employed reduced and the continuation of the financial crisis definitely makes the things worse to the earnings to its equity investors.

All investment valuation indicators moved up during the period of the study. Earnings per share have increased from Rs.2.13 in 2002 to Rs. 15.60 in 2010 and its growth was continuous until 2008. The company has paid dividend throughout the period and in absolute terms it has increased even during the bad days of business. Book value of its share has gone up from Rs. 108.42 to Rs. 204. 74 and price to book value is less than unity in almost all years of the study. Price Earnings ratio is fluctuating and during the last three years it was abnormally low. Such a trend in these ratios indicates that in spite

of the strong fundamentals the market price of its shares has not fully adjusted to its fundamentals, hence its shares seems to be undervalued at present and which itself indicates a buy signal for investors at this level.

5.6.14: Sterlite Technologies Ltd.

Sterlite Technologies Limited is committed to providing connectivity products and solutions for the ever-evolving applications in the global telecom and power industries. The company is the India's only integrated Optical Fiber manufacturer and is among the select few globally. Sterlite's focus on technology enhancements has resulted in the acceptance of its telecom and power products in 60 countries across 6 continents. The company has its operations in the countries like USA, UK, Russia, China, Thailand, UAE etc…

Sterlite Optical Technologies Ltd was incorporated on 24 March 2000 under the name of Sterlite Telecom Systems Ltd. It was formed after the demerger of the telecom business from Sterlite Industries (India), with effect from July 1, 2000 to enable sharper focus on each of the businesses. On 21 August 2000, the Company's name was changed from Sterlite Telecom Systems Ltd to Sterlite Optical Technologies Ltd. On July 2007, the company got its present name, Sterlite Technologies Ltd. The company has its manufacturing facilities at Aurangabad and Pune in Maharashtra, Silvassa in Dadra and Nagar Haveli, and Haridwar in Uttarakhand.

Table 5.14

Financial performance of Sterlite Technologies Limited Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	747.88	680.13	116.91	90.19	324.15	550.61	1,204.57	1,683.89	2,289.34	2,430.80
Sales growth (%)		-9.06	-82.81	-22.86	259.41	69.86	118.77	39.79	35.96	6.18
Net earnings (in Rs. crores)	225.64	100.18	-86.14	-18.95	10.22	40.77	50.86	100.72	88.02	246.07
Earnings growth (%)		-55.60	-185.99	-78.00	-153.93	298.92	24.75	98.03	-12.61	179.56
Operating profit margin (%)	35.56	23.19	-29.36	-38.65	13.27	11.59	9.62	12.3	10.23	15.67
Net profit margin (%)	30.17	14.73	-73.68	-21.01	3.15	7.40	4.22	5.98	3.84	10.12
Return On Investment (%)	48.65	29.81	-8.56	-2.26	5.11	6.52	8.74	15.01	14.52	27.86
Return On Equity (%)	68.95	25.2	-27.94	-7.56	3.92	12.28	12.21	18.67	14.18	26.86
Reserves (in Rs. crores)	299.25	369.48	280.31	222.72	232.94	296.95	381.15	507.28	583.41	813.91
Debt Equity ratio (times)	0.84	0.47	0.95	0.67	0.56	0.72	1.41	1.23	0.80	0.39
Current ratio (times)	3.13	1.67	1.93	1.47	1.37	2.29	2.72	2.65	1.65	1.61
Market price per share (Rs.)	363.05	134.85	112.4	49.05	61.7	97.15	182.00	162.85	70.25	88.25
Book value per share (Rs.)	58.44	70.99	55.06	44.77	46.6	55.51	66.88	83.69	95.4	24.89
Earnings Per Share (Rs.)	40.30	17.89	-15.38	-3.38	1.83	6.93	8.26	15.62	13.64	6.92
Dividend Per Share (Rs.)	4.50	0.00	0.00	0.00	0.00	0.50	0.75	1.00	1.25	0.50
Price Earnings ratio (times)	9.01	7.54	-7.31	-14.51	33.72	14.02	22.03	10.43	5.15	12.75
Price to Book ratio (times)	6.21	1.90	2.04	1.10	1.32	1.75	2.72	1.95	0.74	3.55
No. of shares (in lakhs)	559.95	559.95	559.95	559.95	559.95	587.95	615.95	644.68	645.38	3555.19
Dividend yield (%)	1.24	0.00	0.00	0.00	0.00	0.51	0.41	0.61	1.78	0.57
Dividend yield (%)										

Source: Annual reports

It is clear from Table 5.14 that Sterlite Technologies has attained remarkable growth, more than tripling its sales revenues during the period between 2001 and 2010 . However the growth in revenues has not been accompanied by a marked improvement in its profitability. The net earnings of the company have grown only at a marginal rate during this period. But when we look into the performance of the company during the last three years of the study we can know that even during the recession years the company is able to undergo with explosive growth in its earnings parameters. From the published sources of the company it is known that such growth is mainly achieved by its increased operating revenues from the new green field Power Transmission and Distribution Conductor facility at Haridwar.

The profit margins of the company (operating and net) have considerably shrunk during the study period which indicates the increasing operating cost to the company. The rates of return measures (return on capital employed and return on net worth) declined initially in succession, but later improved and ended with the best rates of the study period. Such a trend in these measures indicates that there is marginal increase in efficiency of the company from point of view of total funds. Comparison of return on net worth with return on capital employed shows that in certain years (from 2006 to 2008) the company was able to generate a return on its shareholders fund at a rate higher than its rate of return on investments which was the outcome of its financial leverage policy.

Sterlite has been using considerable amount of debt funds for financing its capital investments. In certain years the ratio was greater than unity indicating larger amount of debt relative to its net worth in the capital structure which caused increased financial risk to the firm at the advantage of trading on

equity. But during the last three years of the study it has shown a declining trend in this ratio. The current ratio of Sterlite has been fairly high over the years of the study as compared to the generally accepted norm of 2. This indicates that the dependence on short term liabilities and creditors is less and the company has been following a conservative working capital policy.

The Earnings per Share of the company has declined during the first three years of the study, then gradually improved and reverted back to its origin level in 2010 (considering the increase in number of shares). Similar trend is observed in its book value of share also. With regard to the dividend payment also the company is much conservative as it has paid hardly 10 per cent of its net earnings as dividend to its shareholders during good earning days. Its stock is traded at premium price earnings multiple in most of the years and the trend in this ratio during the last 5 to 6 years and its relatively high price book value ratio during the period indicates the investor optimism and confidence about the growth potentials of Sterlite. When we look in to the potential of Telecom and Power Transmission business in future and if the company is able to continue with its current momentum in technology business, its growth will be faster than the past.

5.6.15: Geometric Ltd

Geometric Ltd, formerly Geometric Software Solutions Co Ltd, is an India-based company that specializes in the domain of engineering solutions, services and technologies. Their products and services are provided to the Product Lifecycle Management (PLM) market, Computer Aided Design and Computer Aided Manufacturing markets worldwide. Geometric began as a part of the Godrej group (in 1984), one of the oldest and largest business conglomerates of India with expertise in engineering and consumer products.

Geometric Ltd was incorporated in the year 1994 as Geometric Software Services Co Pvt Ltd and became a deemed public company in September 1994. The name of the company was subsequently changed to Geometric Software Solutions Co Ltd with effect from August 1998. Today Geometric is one of the leading PLM service providers in the world. Geometric is offers a wide range of services based on its 'offshore/ onsite' model which include development, customization, implementation, migration, integration, customization, training and support services across various CAD systems.

Sales of Geometric increased consistently throughout the period of the study. But the steady increase in its net earnings was visible only during the first five years of the study, after that it oscillated significantly. However, the net earnings spanned from Rs. 8.91 Crores (in 2001) to Rs. 43.01 Crores (in 2009) and then sharply declined to 13.64 Crores in the next year which is on account of short fall of sales during the year. The operating profit margin increased from 23.03 to 25.19 per cent in 2003 and the fluctuated and finally declined to 13.14 per cent in 2010. But the net profit margin increased from 19.86 to 26.17 percent (2001-2004) and then reverted back to the origin level in 2009 before shrank to 6.38 per cent in 2010. Such a divergence in these ratios happened because of the presence of relatively large amount of non operating income in total revenue earnings of the company. Similar trend is perceived in its rates of return measures also.

Current ratio of the company has improved from – to – hence the company's immediate financial solvency is very good. The company mainly depends on ownership funds for financing more than 90 percent of its investments. Debt component in the capital structure is very meager and reserve base of the company significantly widened during the period of study. Such a trend in capitalization ensures sound financial solvency position of Geometric.

Table 5.15

Financial performance of Geometric Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	44.87	57.22	59.07	63.67	95.44	118.1	175.32	172.37	230.38	213.74
Sales growth (%)	...	27.52	3.23	7.79	49.90	23.74	48.45	-1.68	33.65	-7.22
Net earnings (in Rs. crores)	8.91	12.6	13.36	16.66	20.63	17.66	30.86	22.34	43.01	13.64
Earnings growth (%)	...	41.41	6.03	24.70	23.83	-14.40	74.75	-27.61	92.52	-68.29
Operating profit margin (%)	23.03	24.23	25.19	21.26	24.03	14.75	14.84	9.08	15.25	13.14
Net profit margin (%)	19.86	22.02	22.62	26.17	21.62	14.95	17.60	12.96	18.67	6.38
Return On Investment (%)	16.84	20.65	21.99	19.65	24.68	18.54	16.37	15.39	25.57	10.69
Return On Equity (%)	17.19	19.98	18.38	18.85	19.40	14.52	15.59	10.51	22.93	6.31
Reserves (in Rs. crores)	46.59	57.79	67.39	82.55	95.14	110.29	185.51	200.17	175.14	203.83
Debt Equity ratio (times)	0.00	0.00	0.04	0.00	0.01	0.00	0.11	0.07	0.06	0.04
Current ratio (times)	1.60	1.45	1.43	1.52	1.98	1.58	3.18	3.11	3.38	4.61
Market price per share (Rs.)	65.15	429.75	429.3	494.95	490.00	101.10	100.20	52.15	14.55	63.80
Book value per share (Rs.)	98.85	119.97	136.91	151.11	95.29	21.47	31.96	34.23	30.20	34.82
Earnings Per Share (Rs.)	17.00	24.00	25.00	28.50	18.5	3.12	5.00	4.00	7.00	2.00
Dividend Per Share (Rs.)	0.30	3.00	4.00	5.00	4.00	0.80	0.80	0.80	0.80	1.10
Price Earnings ratio (times)	3.83	17.91	17.17	17.37	26.49	32.40	20.04	13.04	2.08	31.90
Price to Book ratio (times)	0.66	3.58	3.14	3.28	5.14	4.71	3.14	1.52	0.48	1.83
No. of shares (in lakhs)	52.44	52.55	53.10	58.5	111.55	566.58	619.28	621.04	621.14	621.14
Dividend yield (%)	0.46	0.70	0.93	1.01	0.82	0.79	0.80	1.53	5.50	1.72

Source: Annual reports

The company is following a stable dividend policy in the sense that it pays almost constant dividend per share despite the fluctuations in EPS. Market price of the shares move around Rs.450 to Rs.500 in most of the years (after adjusting the bonus issue in 2006) and during the last three years the price of its stock terribly fall down. Price Earnings ratio of the company is relatively better than that of its peers, however volatile subject to market conditions.

5.6.16: Visesh Infotecnics Ltd.

Established in 1989 as an ERP Software Products Company, Visesh Infotecnics Ltd. is today, a mature and fast growing company committed to providing reliable and cost-effective I.T. solutions to organizations globally. Emphasis on quality, world-class human resources and cutting edge solutions drive its commitment. The company has a comprehensive industry-wise client list with its software and technology solutions being used successfully in almost all industry verticals, such as telecommunications, chemicals, automobiles, pharmaceuticals, services (including finance & ITeS), government, education, sugar, sales & distribution etc. partner with software skills, networking expertise, project management experience and domain knowledge in every aspect of Information Technology. Visesh Infotechnics Ltd (VIL) was incorporated on January 1989 as "Ultimate Software Private Ltd". The name was later changed to Visesh Technologies Pvt Ltd on February 1993 and subsequently it became a deemed public company w.e.f. May 1995. The name of the company was changed to Visesh Infosystems Ltd on July 1997 which has subsequently changed to its current name. During 2001 the company entered into strategic alliance with Citrix Software India for conversion of ERP solution into Web Enabled Solution.

Table 5.16 gives a brief description on the performance of Visesh Infotecnics Ltd in financial terms during the period 2001 to 2010.

Table 5.16

Financial performance of Visesh Infotecnics Ltd.

Year ended	Jun-01	Jun-02	Jun-03	Mar-04	Mar-05	Mar-06	Mar-07	Mar-08	Mar-09	Mar-10
Sales (in Rs. crores)	19.82	18.41	21.94	19.37	35.47	78.46	110.22	112.15	105.29	124.64
Sales growth (%)	....	-7.11	19.17	-11.71	83.12	121.20	40.48	1.75	-6.12	18.38
Net earnings (in Rs. crores)	2.06	0.94	0.53	0.11	1.95	11.05	15.81	10.93	1.80	1.26
Earnings growth (%)	...	-54.37	-43.62	-71.70	1672.73	466.67	43.08	-30.87	-83.53	-30.00
Operating profit margin (%)	19.05	15.09	11.14	13.70	13.68	23.42	28.59	24.45	13.49	11.95
Net profit margin (%)	10.26	5.07	2.41	0.57	5.50	14.04	14.33	9.72	1.68	1.01
Return On Investment (%)	8.90	3.17	1.90	2.44	6.94	16.73	23.40	11.26	4.13	3.11
Return On Equity (%)	7.75	2.76	1.39	0.29	4.74	13.68	15.94	7.34	1.20	0.76
Reserves (in Rs. crores)	16.57	21.33	23.2	23.31	25.13	45.52	61.33	102.62	108.15	109.82
Debt Equity ratio (times)	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
Current ratio (times)	13.14	13.89	3.05	2.48	1.17	1.69	2.07	3.45	3.15	2.65
Market price per share (Rs.)	17.1	12.65	4.10	4.00	25.05	55.10	30.15	18.50	3.05	5.65
Book value per share (Rs.)	26.57	26.79	25.55	25.62	26.84	26.88	32.74	38.28	39.81	35.79
Earnings Per Share (Rs.)	2.06	0.74	0.36	0.07	1.31	4.10	5.86	3.01	0.50	0.30
Dividend Per Share (Rs.)	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Price Earnings ratio (times)	8.30	17.09	11.39	57.14	19.12	13.44	5.15	6.15	6.10	12.00
Price to Book ratio (times)	0.64	0.47	0.16	0.16	0.93	2.05	0.92	0.48	0.08	0.16
No. of shares (in lakhs)	100.00	127.00	149.25	149.25	149.25	269.73	269.73	362.82	362.82	425.82
Dividend yield (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Annual reports

Sales of VIL in 2010 are about more than six times of its sales in 2001. But its net earnings did not grow at that rate during that period. Between 2005 and 2007 the earning profile of the company was really fantastic. The analysis observed increase in operating profit and net profit margins during this period (especially between 2004 and 2007). But the gap between these two ratios are widening particularly during low earning years. This is because a significant portion of its operating earnings is consumed by the company for meeting its non operating expenses which should be controlled for better public image. The changes in rates of return measures also are also in parity with changes in profit margins. Such a trend throws up some doubts as to the profitable use of funds supplied by the shareholders.

The liquidity ratios indicate that considerable deterioration has occurred in the short term solvency position of the company. However by the end of the period, it reached above the standard norm. The debt content in the total capitalization become almost zero signalling the adequate margin of safety of funds to both lenders and investors.

With regard to dividend policy, its shareholders might not be satisfied as it has paid dividend only once (in 2006). The movement of price of its stock is not much promising on account of which Price Earnings ratio of VIL remains very low. Price to book value ratio is less than unity in most of the years. Low Price Earnings ratio as well as price to book value ratio indicates investor expectations about VIL and its market appraisal is abnormally poor.

5.6.17: CMC Ltd.

CMC Ltd is a pioneer IT solutions company in India and a subsidiary of Tata Consultancy Services Ltd. They are involved in the design, development and implementation of software technologies and applications. They are specialized in providing a broad range information technology solution to a diverse base of global as well as national clients. CMC's business is organized into four strategic business units namely customer services, system integration, IT enabled services and education and training. The customers of the company include Reserve Bank of India, Indian Railways, Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd, Oil and Natural Gas Corporation Ltd, Bank of India, United Western Bank, Bank of Baroda etc…

CMC was incorporated on December 26, 1975, as the 'Computer Maintenance Corporation Private Limited'. The Government of India held 100 per cent of the equity share capital. On August 19, 1977, it was converted into a public limited company. In 1978, when IBM wound up its operations in India, the company took over the maintenance of IBM installations at over 800 locations around India and, subsequently, maintenance of computers supplied by other foreign manufacturers as well. During its transition from a hardware maintenance company to a complete end-to-end IT solutions provider it executed 'Project Interact' (International Education and Research for Applications of Computer Technology), a UN project involving design, development and systems-engineering of real-time, computer-based systems dedicated to applications in the areas of power distribution, railway freight operations management, and meteorology. To reflect its diversified business activities, the company was

renamed as 'CMC Limited', and obtained a fresh certificate of incorporation dated August 27, 1984.

For expanding its operations and market their products and service offerings in US markets, in 1991, CMC acquired Baton Rouge International Inc, USA (it was subsequently renamed CMC Americas, Inc, in 2003), one of the first cross-border acquisitions by an Indian IT firm. To service and develop its clientele in the UK and Europe, they opened a branch office in London, in 2000. In line with its strategy of offering its products and services globally, in 2003, CMC opened a branch office in Dubai to tap the hitherto unexplored markets of West Asia and Africa.

Government divested its holdings -16.69 per cent to GIC and its subsidiaries (in 1992), 51 per cent to Tata Sons Ltd (1n 2001) and the remaining holdings (in 2004) to the public. Tata Sons Ltd transferred their entire shareholding of CMC to Tata Consultancy Services Ltd in 2004.

The results of the financial analysis of CMC Ltd. are summarized in Table 5.17. The analysis shows that there has been significant improvement in the earnings position of CMC Ltd particularly after the financial year ended March 2005. The increased amount of earnings has brought in to improved profit margins for the company during that period. Unlike other companies in the group CMC Ltd is able to make marginal growth in their rates of return measures (from 2005 to 2008) and thereafter maintained stability. This gives an indication of the efficient use of capital additionally invested by the company for expanding business operations. So it is nothing irrational to believe that CMC Ltd can maintain its established profits growth over the next few years.

Table 5.17

Financial performance of CMC Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	544.77	552.35	609.29	748.45	776.24	828.81	988.91	977.19	820.45	690.01
Sales growth (%)	....	1.39	10.31	22.84	3.71	6.77	19.32	-1.19	-16.04	-15.90
Net earnings (in Rs. crores)	24.55	33.05	36.49	47.61	22.69	44.11	64.11	88.22	105.57	129.58
Earnings growth (%)	....	34.62	10.41	30.47	-52.34	93.04	28.20	57.11	19.67	22.75
Operating profit margin (%)	8.18	8.75	9.98	8.39	5.36	5.33	9.45	11.72	14.54	21.91
Net profit margin (%)	4.58	5.99	6.04	6.37	2.96	5.3	6.45	8.99	12.74	18.78
Return On Investment (%)	32.87	35.62	29.80	29.64	12.93	20.79	24.18	29.06	27.60	27.19
Return On Equity (%)	37.59	42.48	32.45	26.06	13.38	22.60	31.81	32.84	30.57	31.11
Reserves (in Rs. crores)	59.53	77.63	107.28	145.49	160.40	195.57	217.09	288.38	367.36	461.44
Debt Equity ratio (times)	0.46	0.29	0.42	0.41	0.47	0.32	0.08	0.10	0.09	0.00
Current ratio (times)	1.15	1.20	1.36	1.56	1.57	1.52	1.33	1.30	1.41	1.33
Market price per share (Rs.)	235.05	534.2	494.45	494.05	621.75	531.40	1211.85	806.30	319.95	1340.30
Book value per share (Rs.)	49.29	61.24	80.81	106.03	115.88	139.09	153.29	200.35	252.49	314.58
Earnings Per Share (Rs.)	16.56	22.2	24.46	31.67	15.22	29.12	42.31	58.23	69.68	85.53
Dividend Per Share (Rs.)	3.00	4.00	4.00	5.50	4.50	5.00	8.00	11.00	15.00	20.00
Price Earnings ratio (times)	14.19	24.06	20.21	15.60	40.85	18.25	28.64	13.85	4.59	15.67
Price to Book ratio (times)	4.77	8.72	6.12	4.66	5.37	3.82	7.91	4.02	1.27	4.26
No. of shares (in lakhs)	151.50	151.50	151.50	151.50	151.50	151.50	151.50	151.50	151.50	151.50
Dividend yield (%)	1.49	0.75	0.81	1.11	0.72	0.94	0.66	1.36	4.69	1.49

Source: Annual reports

If we come to the leverage ratio, debt equity ratio of CMC has declined over a period of time (2005-2009) and become almost zero in 2010, which is a positive sign. It has been almost marginal during the period indicating the strong solvency position of the company. Such a trend in leverage ratio positions the company to raise cheaper debt capital easily without causing much dilution in the stake of owners.

When we observe the EPS trends of CMC, it can be easily understood that it began at a low EPS of Rs.16.56 per share in 2001 and has steadily progressed and nearly increased by 8.5 times to Rs.85.53 per share by 2010. Even during the recessionary days this ratio has gone up despite the reduction in sales. The same trend is visible in its book value of share also. Its book value of a share in 2010 is Rs.314.58 which is almost 6 times more than that in 2001. The dividend per share has increased over the years and the company is following a dividend policy of 'constant dividend payout'. Its shares have been traded almost at higher PE level and its Price to Book value found stable during most part of the period of analysis. Such a drift in these share valuation indicators is a sign of investor loyalty with the company.

5.6.18. Calsoft (California Softwares Ltd.)

Calsoft was started in 1992 with a team of around 7 engineers. Today it is a global company with offices in 6 countries and more than 1000 employees. Their offerings span business and technology consulting, product engineering services, application services, systems integration and IT infrastructure services. These services are offered through their 3 Business Units - Calsoft Labs, Calsoft Enterprise and Calsoft Strategic Investments.

Calsoft is started as a joint venture with equity participation from Chemoil Corporation, US (49 percent stake through its subsidiary Kemoil, Hongkong), Chemoil assists the company in marketing, equipment sourcing, etc. Calsoft has set up a 100 per cent export-oriented software technology park at Madras, which commenced commercial operations in October 1992. CSCL commenced operations by managing the MIS services for the Chemoil Group of companies, spread over US, Singapore, Venezuela, Philippines and Denmark.

Analysis of financial data exhibited in Table 5.18 shows that the net earnings of Calsoft widely fluctuated during the period between 2001 and 2010 in spite of the continuous improvement of sales position. In 2009 the company sustained a loss of Rs. 8.05 Crores which is due to the increased operating cost incurred by it for stabilizing its business. The gap between the two profit margins (operating and net) shows that a considerable portion of the operating earnings of the company is used for meeting the payment of financial charges (interest) and other non operating expenses. Thin difference between rate of return on equity and rate of return on capital employed shows that the benefit of trading on equity to investors is very low. It indirectly conveys that the cost of debt incurred by the company and return produced on equity financed portion of its investment are almost at same rate.

Table 5.18
Financial performance of California Softwares Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in Rs. crores)	28.48	19.63	17.52	17.9	25.03	37.43	47.52	69.97	72.61	87.45
Sales growth (%)	....	-31.07	-10.75	2.17	39.83	49.54	26.96	47.24	3.77	20.44
Net earnings (in Rs. crores)	2.3	3.22	0.82	0.81	2.86	6.63	5.95	7.25	-8.05	5.29
Earnings growth (%)	....	40.00	-74.53	-1.22	253.09	131.82	-10.26	21.85	-211.03	152.17
Operating profit margin (%)	15.85	13.93	14.29	13.95	17.07	21.00	16.95	18.80	0.08	26.65
Net profit margin (%)	7.85	15.88	4.48	4.37	11.32	17.65	12.44	10.13	-10.72	6.05
Return On Investment (%)	10.59	12.94	3.26	3.12	10.11	19.10	8.66	6.80	-8.17	5.24
Return On Equity (%)	12.06	9.72	6.08	3.42	10.94	18.66	8.02	7.66	0.77	10.30
Reserves (in Rs. crores)	16.95	20.12	20.41	21.22	23.52	29.79	59.68	94.27	86.22	88.61
Debt Equity ratio (times)	0.13	0.07	0.03	0.02	0.04	0.88	0.22	0.61	0.80	0.65
Current ratio (times)	3.80	8.53	8.34	11.17	4.83	4.98	9.80	2.69	1.13	0.88
Market price per share (Rs.)	110.50	30.90	11.50	21.50	47.05	107.25	55.90	83.00	19.00	42.20
Book value per share (Rs.)	45.60	52.27	52.86	54.57	59.41	70.54	75.97	86.24	79.73	81.66
Earnings Per Share (Rs.)	22.88	4.56	6.69	12.57	7.83	7.96	8.50	14.16	-2.92	9.86
Dividend Per Share (Rs.)	0.00	0.00	1.00	0.00	1.00	1.00	0.75	1.00	0.00	2.00
Price Earnings ratio (times)	4.83	6.77	1.72	1.71	6.01	13.47	6.58	5.86	.	4.28
Price to Book ratio (times)	2.42	0.59	0.22	0.39	0.79	1.52	0.74	0.96	0.24	0.52
No. of shares (in lakhs)	47.61	47.61	47.61	47.61	47.61	49.21	90.46	123.65	123.65	123.65
Dividend yield (%)	0.00	0.00	8.70	0.00	2.13	0.93	1.34	1.20	0.00	4.74

Source: Annual reports

Use of borrowings in the capitalization process of the company terrifically increased during the last 3 years. Debt equity ratio increased from 0.22 in 2007 to 0.65 in 2010 and the trend of which shows that the financial risk is relatively high for its investors. At the same time the company is not able to deliver attractive premium for their risk to its owners. Short term liquidity of the company is weakening year by year. In 2008 the ratio is less than 1 which indicates that the company is facing the problem of negative working capital and there is more chance for default payment.

Earnings per share of the company have been fluctuating over the years. Similar observation is made with regard to the dividend per share also. Low price to book value and low and falling Price Earnings ratio all are true indicators of woes of investors as to the incremental risk and diminishing return of their investment with the company.

5.6.19: HCL Technologies Ltd.

HCL Technologies is one of the leading Indian IT services companies, offering a range of services, including EAS, engineering, research and development, custom applications, remote infrastructure management, and BPO. It caters to various industry verticals, including financial services, manufacturing, telecom, retail, life sciences, media and entertainment, and energy and utilities. Its business operations spanning over 29 countries and the major business development centres located at US, UK, China, Japan, Latin America etc. Its major subsidiaries include HCL Comnet Systems and Services Ltd, HCL Technologies, America etc...

HCL Technologies Limited was incorporated in 1991, as HCL Overseas Limited. The certificate of commencement of business was received on 10th February 1992. On July 14, 1994, the name of the Company was changed to HCL Consulting Limited. In 1996 the 50:50 joint venture with Perot Systems Corporation was formed to provide access to

high value client base of Perot Systems under the name of HCL Perot Systems NV. HCL Technologies focuses on Transformational Outsourcing, working with clients in areas that impact and re-define the core of their business after its IPO in 1999 with aim of foray into the global IT landscape and in the same year again the Company changed its name to HCL Technologies Limited.

HCL has global partnerships with several leading Fortune 1000 firms, including several IT and Technology majors such as Intel, Microsoft, Toshiba, AMD, Nokia, IBM etc. It has won the India's most preferred personal Computer brand by CNBC AWAZZ consumer award 2007. It has ranked as India's 'No. 1 PC Vendor' consecutively for six years by Dataquest.

It came to know from Table 5.19 that HCL Technologies Ltd received fascinating growth in its revenue position during the period between 2001 and 2010. When its sales revenue expanded more than 7 times (Rs. 50.79 billion from 7.25 billion), its profit position grew by three times during the same period. The company posted net sales of over Rs.121 billion in 2009-10, registering a growth of more than 18 per cent over the previous year. This was underpinned by the strengthening of its capabilities in the infrastructure services segment, coupled with the increased scale of its enterprise application services (EAS). Profit margins of HCL Technologies over the years have reduced. Net profit margin declined from 21.05 per cent in 2001 to 14.14 per cent in 2009, but reverted back to original level at the end of the period. Operating margin decreased from 51.20 per cent to 27.83 per cent during the same period. The higher operating profit margins have a favorable effect on the return on capital employed which improved 25 per cent to 28.59 per cent (in 2009). Its all profit measures were significantly reduced during the recession hit year of 2010. In spite of the growth in net worth of the company, the relatively higher growth in its profit after tax caused increase in its return on net worth from 25 percent to 28.59 per cent.

Table 5.19

Financial performance of HCL Technologies Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in billions)	7.25	7.23	8.72	11.28	14.47	30.33	37.68	46.15	46.75	50.78
Sales growth (%)	.	-0.15	20.50	29.40	28.28	-44.04	15.72	30.93	13.26	1.73
Net earnings (in crores)	4.27	4.02	3.12	3.26	3.29	6.38	11.01	7.80	9.97	10.57
Earnings growth (%)	.	-5.82	-22.26	4.24	1.09	93.88	72.60	-29.15	27.75	5.94
Operating profit margin (%)	51.20	46.09	32.59	25.26	24.64	26.70	24.87	26.58	29.62	27.83
Net profit margin (%)	21.05	24.26	19.77	17.88	20.30	19.50	20.34	17.19	14.14	20.80
Return On Investment (%)	25.00	19.11	13.49	14.22	11.51	24.77	32.17	24.28	28.59	21.41
Return On Equity (%)	26.74	20.02	13.93	14.72	11.85	25.93	34.57	27.78	30.72	19.80
Reserves (in billions)	16.48	20.44	22.56	22.32	27.96	25.11	32.92	30.80	33.54	47.99
Debt Equity ratio (times)	0.00	0.001	0.002	0.04	0.033	0.005	0.011	0.008	0.15	0.28
Current ratio (times)	6.68	5.11	1.92	0.68	0.81	0.99	1.41	1.12	1.83	2.24
Market price per share (Rs.)	289.4	223.45	154.45	298.5	389.5	504.65	343.95	252.55	185.95	358.4
Book value per share (Rs.)	59.83	73.01	80.23	77.38	89.59	79.64	51.61	48.22	52.04	72.69
Earnings Per Share (Rs.)	14.97	13.77	10.72	11.00	10.31	19.74	16.60	11.72	14.88	15.57
Dividend Per Share (Rs.)	1.00	1.50	4.00	10.00	16.00	16.00	8.00	9.00	7.00	4.00.
Price Earnings ratio (times)	19.33	16.23	14.41	27.14	37.78	25.56	20.72	21.55	12.50	23.02
Price to Book ratio (times)	4.84	3.06	1.93	3.86	4.35	6.34	6.66	5.24	3.57	4.93
No. of shares (in lakhs)	28.49	28.79	28.84	29.61	31.92	32.34	66.37	66.63	67.03	67.88
Dividend yield (%)	0.35	0.67	2.59	3.35	4.11	3.17	2.33	3.56	3.76	1.12

Source: Annual reports

HCL Technologies also has a favorable financial risk profile as reflected in its large net worth, low gearing, healthy debt protection indicators, and strong liquidity. Though the company is not making any advantage of financial leverage due to this the investors are totally relieved from the worries of financial risk. The short term liquidity position of the company almost satisfactory as the company is able to maintain its current ratio at a rate higher than the standard stipulated for this under normal conditions (2:1).

All of the investment valuation ratios showed upward trend during the period of the study. It can see that both EPS and book value of its share have gone up during the period (when we consider the increase in the number of shares). Similarly dividend per share also has substantially improved from Rs 1 to Rs. 4 during the same period. The Price Earnings ratio of the company has slightly increased during the period and same is the case of Price to Book ratio also. An important thing is to be noticed here that both of these measures were very high in mid years, but later they consolidated to their present level. So at present the shares of HCL Technologies are more precisely valued by the market.

5.6.20: Polaris Software Lab Ltd.

Polaris Software Lab is one of the world's most sophisticated financial technology companies. Polaris is the chosen outsourcing partner for 10 out of the 15 top global banks and 6 out of the 10 global insurance

companies. Polaris offers state of the art, comprehensive solutions for core banking, corporate banking, wealth management, asset management and insurance solutions. Polaris is recognized by world's top analysts as global leader in banking software and insurance software. Incorporated in 1993 and headquartered in Chennai, India, the company has presence in Australia, Bahrain, France, Germany, Hongkong, Ireland, Japan, Korea, Saudi Arabia, UAE, Singapore, Switzerland, United Kingdom, United States and Canada through its work field offices.

Polaris was rated amongst Forbes World's Best Small Companies in 2000 and ranked among Top 10 IT Wealth Creators by Business Today in 2002. .Polaris is featured in the top 100 companies' worldwide providing services to the financial sector (Fintech 100, a list published by American banker research firm - Financial insights) at rank of 4 (amongst Indian companies) and 39 worldwide. Polaris is one of the few integrated mid Information Technology companies having a strong foothold in the BFSI vertical and offering in both the service and solution segmentation.

Table 5.20 gives a vivid picture of the both financial strength and operational efficiency showed by Polaris during the period of the study.

Table 5.20

Financial performance of Polaris Software Lab Ltd.

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	265.52	273.92	396.07	578.49	668.97	683.94	904.3	938.02	1171.34	1143.48
Sales growth (%)	...	3.16	44.59	46.06	15.64	2.24	32.22	3.73	24.87	-2.38
Net earnings (in crores)	60.1	61.65	54.23	67.7	53.43	13.3	79.59	52.63	111.2	130.64
Earnings growth (%)	.	2.58	-12.04	24.84	-21.08	-75.11	498.42	-33.87	111.29	17.50
Operating profit margin (%)	23.87	23.67	23.74	20.46	12.39	9.29	14.72	9.08	17.55	15.72
Net profit margin (%)	22.28	21.71	13.87	11.81	7.80	1.93	8.75	5.50	9.79	11.42
Return On Investment (%)	31.24	25.26	12.37	13.71	10.09	2.50	13.97	8.75	16.02	16.75
Return On Equity (%)	31.58	26.82	15.83	16.47	11.43	3.94	16.53	10.74	18.26	19.30
Reserves (in Crores)	175.38	218.43	389.74	444.91	480.35	482.15	520.56	551.97	644.68	730.60
Debt Equity ratio (times)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current ratio (times)	3.48	3.58	2.56	4.06	3.29	3.21	2.93	2.74	1.98	1.33
Market price per share (Rs.)	249	202.5	121.6	175.55	107.8	117.1	180.6	78.6	45.05	163.9
Book value per share (Rs.)	56.39	47.68	80.69	50.54	54.01	54.08	57.8	60.94	70.33	78.83
Earnings Per Share (Rs.)	17.61	12.04	10.53	6.93	5.45	1.35	8.07	5.33	11.27	13.20
Dividend Per Share (Rs.)	1.50	1.75	3.30	1.75	1.75	1.25	2.25	1.50	2.75	3.5
Price Earnings ratio (times)	14.14	16.82	11.55	25.33	19.78	86.74	22.38	14.75	4.00	12.42
Price to Book ratio (times)	4.42	4.25	1.51	3.47	2.00	2.17	3.12	1.29	0.64	2.08
No. of shares (in lakhs)	341.25	511.83	514.95	976.99	980.10	982.30	985.82	986.75	986.75	989.60
Dividend yield (%)	0.60	0.86	2.71	1.00	1.62	1.07	1.25	1.91	6.10	2.14

Source: Annual reports

Polaris software Lab's revenues from software products and services grew consecutively from Rs. 265.52 Crores in 2001 to Rs. 1143.48 Crores in 2010. Similarly its reported earnings spanned from Rs. 60.10 Crores to Rs. 130.64 Crores during the same period, although some fluctuations during certain years. The company was able to make outstanding growth even during recession years. This was definitely because of better cost management and increased revenues from its operating sources. Company's profit margins (both operating and net) declined significantly during first six years of the study but later especially during the last two years these profitability measures has improved significantly. Impact of fluctuations in the profit margins is clearly visible in the rates of return measures also. During the mid period of the study they fluctuated heavily before consolidating its position about 19 per cent and 16 per cent respectively for return on net worth and return on capital employed. If the present trend continues we can expect more from the Polaris.

Debt financing by Polaris Lab is very mild indicating its strong solvency position. There is ample scope for raising more debt funds for meeting its finance requirements which place the investors in a better position to enjoy the privilege of trading on equity. Short term liquidity as measured by the current ratio is found good powered by the improved operating earnings. However during the last two years the liquidity conditions of the company weakened considerably.

Improving Earnings per share and better dividend payout all are leading indicators of the upside movement of its stock in the coming future. Moderate to high price book value ratio, relatively large and consolidated Price Earnings ratio - all are signs of potentially high valuation of stocks by

the market. More over the present valuation of the looks attractive as its level in 2010 given some of the peers which are poorer to Polaris in fundamentals are trading at significantly higher Price Earnings multiple.

5.6.21: Mastek Ltd.

Mastek Limited (Mastek) publicly held, leading IT player with global operations providing enterprise solutions to insurance (Life, Pension and General), government/public sector and financial services verticals worldwide. The Company was incorporated on 14th May 1982, with its principal offshore delivery facility based at Mumbai, India; Mastek operates across the US, Europe, Japan, Asia Pacific regions and Middle east, also has been at the forefront of technology, which along with proven methodologies and processes, increase IT value generation to its customers through onsite and offshore deliveries.

Mastek's business and Technology services comprising of IT consulting, Application development, Systems integration, Application management outsourcing testing, Data warehousing and Business intelligence CRM services etc.. Mastek was the first company which had introduced Relational Database Management System (RDBMS) and had developed Enterprise Resource Planning in India.

Mastek had attained the position, among top 15 Indian IT companies as per NASSCOM survey in the year 2006. Mastek had ranked in the top 50 global outsourcing providers in The Black Book of Outsourcing published by the Brown-Wilson Group of the year 2007. The Company has been ranked among the 'Top 20' among the leaders of 'Global Outsourcing 100 Companies 2008' by the International Association of Outsourcing Professionals, published in Fortune magazine in May of the year 2008.

Table 5.21

Financial performance of Mastek Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	82.22	109.56	128.43	118.32	255.41	386.73	498.19	583.27	588.17	435.64
Sales growth (%)	...	33.25	17.22	-7.87	115.86	51.42	28.82	17.08	0.84	-25.93
Net earnings (in crores)	14.4	28.96	38.08	12.25	47.37	49.26	102.55	99.23	95.65	37.00
Earnings growth (%)	-	101.11	31.49	-67.83	286.69	3.99	108.18	-3.24	-3.61	-61.32
Operating profit margin (%)	27.36	44.50	34.94	25.21	25.05	17.65	17.48	21.74	21.44	11.49
Net profit margin (%)	17.51	26.43	29.65	10.35	18.55	12.74	20.58	17.01	16.26	8.49
Return On Investment (%)	19.89	38.37	31.35	11.88	31.45	29.66	43.05	37.68	27.74	6.37
Return On Equity (%)	18.44	30.87	29.69	9.55	28.77	24.30	36.40	34.02	27.35	9.79
Reserves (in crores)	61.50	86.82	121.21	121.28	157.72	188.64	267.53	278.12	336.25	364.61
Debt Equity ratio	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current ratio	2.01	1.54	1.70	1.23	1.21	1.19	1.30	1.17	1.09	1.87
Market price per share	113.15	359.25	511.9	200.05	364.2	362.65	309.15	331.1	117.6	334.5
Book value per share	49.29	67.15	90.88	92.38	118.72	72.04	98.99	105.57	130	140.32
Earnings Per Share	9.35	20.15	26.98	8.83	34.16	17.51	36.03	35.92	35.56	13.73
Dividend Per Share	2.00	3.00	3.00	3.00	7.50	10.00	7.50	10.00	10.00	3.25
Price Earnings ratio	12.10	17.83	18.97	22.66	10.66	20.71	8.58	9.22	3.31	24.36
Price to Book value ratio	2.30	5.35	5.63	2.17	3.07	5.03	3.12	3.14	0.90	2.38
No. of shares issued (lakhs)	138.84	139.69	141.14	138.80	138.69	281.38	284.64	276.25	268.99	269.44
Dividend yield	1.77	0.84	0.59	1.50	2.06	2.76	2.43	3.02	8.50	0.97

Source: Annual reports

From Table 5.21 it is apparent that Mastek scored consistent and consecutive improvement in its revenue during the period 2001- 2009. But in 2010 there occurred considerable reduction in its sales revenue. The earnings of the company for the last few years have been shrinking and the rate of decrease was shocking in 2010. As a global outsourcing company it has to heavily depend on overseas market and the recessionary pressures prevailing there have brought in financial distress to the company during that year. When we look in to the rates of return measures it is understood that the capital employed mainly derived from ownership sources lucrative in terms of the rate of return on it (except in 2010). On an average the company is able to generate more than 30 per cent of return on its capital employed and equity during the study period which indicates that the company is able to utilize the amount of capital employed in the business more productively than that done by its peers in the industry.

The financial position of Mastek is found sound from the point of view of solvency and liquidity. Debt equity ratio of the company remained almost zero throughout the period. Increased profit position induces the management to appropriate large amount of funds for internal financing which hardly compel the firm to go for leverage financing, although the shareholders are deprived of the advantage of trading on equity. Better revenue position helped the company to maintain its liquidity position at a consistent level.

The market price of the stock hovered around Rs.300 in most of the years of the study. Existence of such trend in share prices given the doubling of number of shares during the period, viewed really fantastic by a rational investor. Relatively high price book value ratio, increasing and

higher price earnings ratio - all are indicators of the investor confidence about the future prospects of the company and also the investment in its stock. Increasing trend in dividend per share even during recession years gives an indication of assured return to those who like to have a regular income generating asset in their portfolio. From these facts it is reasonable to conclude that the Mastek is a fundamentally strong security for investment.

5.6.22: Ramco Systems Ltd.

Ramco Systems Ltd. (Ramco) is a global provider of Enterprise Solutions and Services in key areas such as Manufacturing, Aviation, Asset Management, Trading & Logistics, Healthcare, eGovernance, Banking and Financial Services, Corporate Performance Management and Human Resources Management. It is also a Siebel Alliance Partner and provides CRM implementation services to global customers. Ramco provides Converged Networking Solutions, Information Security Services and total Contact Centre Solutions. In the Factory Automation space, Ramco provides Engineering Process Optimization solutions (EPOS) to the Cement, Chemical and Power sectors.

Table 5.22 provides a vivid picture of changing financial condition of Ramco Systems Ltd. during the ten year study period.

Table 5.22

Financial performance of Ramco Systems Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	120.23	93.84	81.02	82.31	115.48	117.47	78.57	96.55	92.35	103.46
Sales growth (%)		-21.95	-13.66	1.59	40.30	1.72	-33.11	22.88	-4.35	12.03
Net earnings (in crores)	1.04	-8.76	-27.32	-33.27	-40.36	-34.07	-32.2	22.93	-1.56	-1.10
Earnings growth (%)		-942.31	-211.87	-21.78	-21.31	15.58	5.49	171.21	-106.80	-29.49
Operating profit margin (%)	11.12	-2.58	-11.62	-3.02	7.79	-5.11	-6.68	-0.03	-4.30	26.59
Net profit margin (%)	0.87	-9.34	-33.72	-40.42	-34.95	-29.00	-40.98	23.75	-1.69	-4.00
Return On Investment (%)	1.59	-1.14	-7.51	-5.13	-38.93	-6.37	-6.11	14.15	6.40	3.69
Return On Equity (%)	0.36	-3.61	-12.83	-13.11	-27.70	-19.41	-22.46	13.79	-0.95	-0.67
Reserves (in Crores)	277.53	234.58	205.24	242.23	133.45	160.18	127.98	150.93	149.37	148.27
Debt Equity ratio (times)	0.11	0.17	0.46	0.48	1.06	0.80	1.13	0.78	0.66	0.81
Current ratio (times)	6.31	5.14	3.87	5.29	1.72	1.71	1.19	1.19	1.25	1.82
Market price per share (Rs.)	335.50	230.20	483.60	239.40	440.15	204.25	127.75	127.90	44.50	93.10
Book value per share (Rs.)	368.94	313.39	275.44	218.48	118.98	114.33	93.35	108.30	107.28	106.57
Earnings Per Share (Rs.)	1.34	-11.33	-35.33	-28.64	-32.95	-22.19	-20.97	14.93	-1.02	-0.71
Dividend Per Share (Rs.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Price Earnings ratio (times)	250.37							8.57		
Price to Book ratio (times)	0.91	0.73	1.76	1.10	3.70	1.79	1.37	1.18	0.41	0.87
No. of shares (in lakhs)	77.33	77.33	77.13	116.18	122.48	153.56	153.56	153.58	153.58	153.58
Dividend yield (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Annual reports

A very disturbing feature of Ramco system is that its sales are highly sensitive to the changes in economic cycles. Its sales declined in first four years of the study, but reverted back its original level in 2007 and then declined to Rs.103.46 Crores in 2010. The net earnings of the company were in negative zone in almost all years, but made a profit of Rs.22.93 Crores (from non operating sources) in 2008. In 2009 and 2010 it again sustained loss and the continuation of such trend really a big concern for the investors whether to hold or release their holdings with the company. When both profit margins were negative in 2009, the company was able to maintain an operating margin of 26.59 per cent in 2010. But cost of relatively huge debt capital consumed significant portion of the profit from operations thereby the net profit position continued as negative. Such a trend shall dispirit the rational investors.

Sizable portion of debt (compared to peers) in the capital structure dilutes its solvency causing more amount of financial risk to the investors. This further dwindles its equity base often causing a situation of watered stock. Liquidity of the company is also at an alarming stage as its short term obligations swallow its current assets year by year.

Market value of Ramco stock tumbled down from Rs.486.3 in 2003 to Rs.93.1 in 2010. Since its Earnings per share contracted an aggravate rate during the period, the stock is traded at an abnormally premium Price Earning multiple relative to the market. Dividends are absent throughout the period. Weaker fundamentals along with wildly volatile market prices signal that the scrip of Ramco system is more favorable to the speculators who are looking for gains from short term market imperfections.

5.6.23: Sonata Software Ltd

Sonata Software is a leading provider of IT consulting and software services globally. Sonata's services range from IT Consulting to Product Engineering Services, Application Development, Application Management, Managed Testing, Business Intelligence, Infrastructure Management, Packaged Applications and Travel Solutions. Headquartered in Bangalore, India, and with a customer base spread across the globe, Sonata has offices in the US, Europe, Middle-East and the Asia-Pacific.

Sonata Software Ltd (SSL), initially set up in 1986 as a division of Indian Organic Chemicals Ltd (IOCL). But later IOCL spun off it as an independent company namely, Sonata Software Ltd, in October 1994. Now It has 8 development centres and 4 subsidiaries across the globe. The subsidiaries of Sonata are Sonata Information Technology Ltd, Offshore Digital Services Inc., Abisko Development Ltd and Sonata Software GmbH.

Sonata has duly recognized for its achievements and excellence in IT business both nationally and internationally. As per the industry rankings released by NASSCOM for 2009-10, Sonata Software figured among the Top 20 IT Software Services Exporters in India for the third consecutive year. It has ranked among Top 50 companies by Dataquest for FY 2009-2010. Moreover Sonata is a certified partner of many of the global software giants such as Microsoft, IBM, SAP, Oracle etc.

Table 5.23

Financial performance of Sonata Software Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	125.39	81.37	83.43	69.58	97.01	148.67	185.83	198.82	243.58	236.09
Sales growth (%)	...	-35.11	2.53	-16.48	39.22	53.25	24.99	6.99	22.51	-3.07
Net earnings (in crores)	33.33	22.17	15.58	11.39	16.40	7.78	35.13	36.69	53.36	60.20
Earnings growth (%)	.	-33.48	-29.72	-26.89	43.99	-52.56	351.54	4.44	45.43	12.82
Operating profit margin (%)	27.55	23.75	24.75	18.10	17.93	21.87	23.32	23.57	31.21	29.32
Net profit margin (%)	26.58	27.25	18.67	16.35	16.91	5.23	18.90	18.45	21.91	25.50
Return On Investment (%)	37.47	13.44	12.77	8.18	11.23	6.47	19.46	19.84	25.21	21.05
Return On Equity (%)	36.56	16.19	10.61	7.48	10.19	4.96	19.68	18.42	23.84	20.60
Reserves (in crores)	81.16	126.43	136.35	141.80	150.47	146.26	168.02	188.72	213.31	281.65
Debt Equity ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current ratio	2.80	15.11	11.01	11.50	8.29	5.32	5.28	4.50	3.79	5.45
Market price per share	27.40	16.55	12.2	9.95	22.00	34.70	62.65	32.5	15.85	56.45
Book value per share	9.12	13.02	13.97	14.48	15.31	14.91	16.98	18.95	21.28	27.78
Earnings Per Share	3.33	1.69	1.48	1.08	1.56	0.74	3.34	3.49	5.07	5.72
Dividend Per Share	0.50	0.35	0.50	0.50	0.65	1.00	1.10	1.10	1.50	1.70
Price Earnings ratio	8.23	9.79	8.24	9.21	14.10	46.89	18.76	9.31	3.13	9.87
Price to Book value ratio	3.00	1.27	0.87	0.69	1.44	2.33	3.69	1.72	0.74	2.03
No. of shares issued(crores)	10.00	10.52	10.52	10.52	10.52	10.52	10.52	10.52	10.52	10.52
Dividend yield	1.82	2.11	4.10	5.03	2.95	2.88	1.76	3.38	9.46	3.01

Source: Annual reports

From Table 5.23 it can be seen that Sonata's sales revenue almost doubled from Rs.125.39 cores in 2001 to Rs.236.09 Crores in 2010. Its earnings position also attained similar rate of growth. The variations in profit margins (operating and net) are attributed to the fluctuations in sales. It is commendable to note that even during the financial crisis days there happened only a small rate of dip in the sales of the company (Rs.243.58 Crores to Rs.236.09 Crores), but its net profit rose from Rs.53.36 Crores to Rs.60.2 Crores. This might be due to the judicious employment of cost management strategies by the company. Even though the rates of return on capital employed and return on net worth exhibited a fluctuating trend during the reference period, it is reached at a blooming rate of more than 20 percent at the end.

The capital structure of sonata is composed entirely of common stock and retained earnings. As the company has been conservatively financed there is no presence of financial leverage and at the same time its earnings to investors neither aided nor disturbed. So the earnings of the company directly fluctuated with the variations in sales only. A company with unstable operating conditions with the absence of capital gearing is justified on this ground. Average current ratio of more than 2 indicates its ability to service its short term creditors in time.

When its Earning per share grew from Rs.3.33 in 2001 to Rs.5.72 in 2010, its book value is almost three fold (Rs.9.12 to Rs.27.78) during the same period. Its Price Earnings ratio remains stable in most of the years. In 2009 there was a long fall in this ratio, which was only due to the dramatic changes in the capital market conditions of the country. From 2004-2007 this ratio was much higher than those of other periods which should be of the higher expectations of the investors about the future of the company. Price to book value has fluctuated within the range of 0.69 to 3.69 times during period of observation and ended with relatively good rate of 2.03. The current performance of Sonata (especially during the days of economic

disorders) and its past performance hints the better performance of the company and its scrip in the financial market in the coming days when the world economy fully freed from the clutches of global financial tsunami.

5.6.24: Zensar Technologies Ltd.

Zensar Technologies (Zensar) is a globally focused software and services company spread across eighteen countries across the world. Zensar provides end-to-end services from IT development to Business Process Outsourcing, from consulting to implementation. With more than 5400 associates and sales and operations presence across US, UK, Germany, Sweden, Finland, Middle East, South Africa, Singapore, Australia, Japan and Poland, the Company delivers comprehensive services in mission-critical applications, enterprise applications, e-business, BPO Services.

Zensar Technologies has longer years of history compared to other Indian IT firms. In 1959, Hollerith Limited took over the Indian business of Powers-Samas Accounting Machines Ltd., London. On 1 October 1959, the name of the company was changed to International Computers and Tabulators Limited and the new trade mark 'I.C.T.' was used in relation to the company's products. In October 1996, ICIL purchased the Software Business from ICIM. On 14 January 2000, the name of ICIL was changed to Zensar Technologies Limited. On 16 August 2001 Zensar Technologies Limited merged with Fujitsu ICIM Limited to form the new company, Zensar Technologies Limited.

Zensar is the Company with industry expertise that spans across Retail and Distribution, Banking, Financial Services and Insurance, Healthcare and Life Sciences, Manufacturing, Energy and Utilities. Zensar's customer network covers Cisco, National Grid, Fujitsu, Marks and Spencer, Danaher Corporation, Electronic Arts, Logitech etc.. Zensar has also forged strategic technology partnerships with global technology leaders such as

IBM, Microsoft, Sun Microsystems and Oracle. These partnerships enable Zensar to leverage its core competencies, ensuring comprehensive and state-of-the-art business solutions to its customers.

Zensar is bestowed with many awards for their continuous perseverance to accredit themselves with globally recognised industry standards by various global institutions. Zensar won the Corporate Governance Business for Social Responsibility Award for 2006 for its unique contribution to the society. In appreciation of its outstanding contribution to Indian trade CNBC-TV 18 has honored Zensar with '**The Exporter of the Year Award'** for three years continuously from 2007 to 2009 for wealth creation in India's international trade community. It has been ranked among the top 20 IT Services Exporters for the year 2009-10 by NASSCOM of India. Zensar has been awarded FICCI's 'Special Jury Commendation' Award by Dr. A.P.J Abdul Kalam, the President of India for the outstanding commitment and contribution to Nation Building through CSR efforts.

An interesting feature that has observed in performance of Zensar (reported in Table 5.24) is that its sales have increased almost 7 times from Rs.70.32 Crores in 2001 to Rs.497.08 Crores in 2010. The company is able to keep its earlier momentum in business performance even during the days of economic decelerations also. When the operating margin rose from 14.64 percent to 21.10 per cent during the study period, the continuous improvement in rate of profit after tax to net sales revenue was attained especially 2006 onwards. In fact first 2 to 3 years there were huge contraction in its earnings, but the turnaround strategies initiated by the company helped a lot to get better its position later years. Improved earnings have made significant impact on its rates of return measures also. Rate of return on net worth increased from 18.22 per cent to 28.63 per cent and the trend in the rate of return on capital employed is also almost same.

Table 5.24

Financial performance of Zensar Technologies Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	70.32	70.29	96.65	126.75	176.31	229.09	278.28	335.87	421.87	497.08
Sales growth (%)	...	-0.04	37.50	31.14	39.10	29.94	21.47	20.69	25.61	17.83
Net earnings (in crores)	11.32	11.22	8.16	14.00	37.59	25.12	33.86	45.38	60.47	84.15
Earnings growth (%)	-	-0.88	-27.27	71.57	168.50	-33.17	34.79	34.02	33.25	39.16
Operating profit margin (%)	14.64	12.4	17.32	14.51	15.16	18.58	16.33	15.94	19.14	21.10
Net profit margin (%)	16.10	15.96	8.44	11.05	21.32	10.97	12.17	13.51	14.33	16.93
Return On Investment (%)	18.30	20.44	15.76	16.00	28.07	18.43	19.54	21.52	24.94	31.84
Return On Equity (%)	18.22	14.67	10.08	15.43	30.65	17.70	19.80	22.13	23.76	28.63
Reserves (in crores)	37.27	52.27	56.75	66.51	99.26	118.44	146.96	181.05	230.47	272.34
Debt Equity ratio (times)	0.04	0.01	0.00	0.00	0.12	0.10	0.08	0.00	0.00	0.00
Current ratio (times)	0.56	3.03	2.51	2.68	2.94	2.89	2.70	2.41	2.70	3.21
Market price per share (Rs.)	59.85	136.8	66.25	78.65	202.1	210.5	243.85	111.1	77.4	272.4
Book value per share (Rs.)	31.37	32.45	34.37	38.56	52.54	60.54	71.44	85.55	106.16	136.23
Earnings Per Share (Rs.)	6.49	4.41	3.5	6.01	16.11	10.72	14.16	18.94	25.23	39
Dividend Per Share (Rs.)	0.00	1.50	1.50	1.70	2.3.00	2.60	3.50	3.80	4.50	5.50
Price Earnings ratio (times)	9.22	31.02	18.93	13.09	12.55	19.64	17.22	5.87	3.07	6.98
Price to Book ratio (times)	1.91	4.22	1.93	2.04	3.85	3.48	3.41	1.30	0.73	2.00
No. of shares (in lakhs)	174.43	232.88	232.88	232.88	233.36	234.36	239.20	239.65	239.65	215.76
Dividend yield (%)	63.65	75.82	80.10	90.71	137.00	156.79	185.55	205.04	254.46	293.94

Source: Annual reports

The company's immediate financial position is very good as it is indicated by its current ratio. Its long term solvency position is very brawny as there has been zero debt in the capital structure of Zensar Technologies especially during the last few years. The persisting trend in the return on capital employed is justifying the increased capital investments of the company.

When Earning per Share of the company in 2010 is Rs.39 which is more than 6 times of its EPS in 2001, its book value increased by around 5 times (Rs.31.37 to Rs.136.23) during the same period. In line with the changes in earnings, the company has paid dividend to its equity investors. The trend in Price earnings ratio and Price to Book value is substantiating the fundamental strength of the company. Only during the market turbulence days caused by global crisis (in 2008 and 2009) even with the strong fundamentals the Price Earnings ratio of Zensar discounted heavily. But in the subsequent year it covered up its earlier losses which indicate the restoration of investor confidence with the company.

5.6.25: Blue star Infotech Ltd.

Blue Star Infotech is a very well established solution provider, particularly in the travel and health sciences industries. The origin of Blue Star Infotech dates back to 1983 when the International Software Division (ISD) of Blue Star was founded at SEEPZ, Mumbai. Blue Star Infotech enjoys a 25-year old relationship with Hewlett-Packard, a Fortune 100 company and has been certified as a Hewlett-Packard's Developer and

Solution Partner Program member. It has a distinguished list of customers across different industries such as Manufacturing, Financial Services, Travel, Retail, Technology, Life Sciences and Engineering. It has the privilege of working with organizations such as Summit Information Systems, McDonald's, Expedia.com, Costco Travels, Warner Brothers, Lehman Brothers, NEC, York, , European Parliament, HLL, United Breweries, Cipla, Raymond, amongst others. The services of BSI are classified in to Product engineering services (product designing and development, product testing, maintenance and support) and Enterprise services (Application development and management, Business intelligence and Enterprise Integration). US is the main offshore market of BSI.

In 2004, it was awarded the 'European Seal of Excellence' for E-Learning - awarded the first time ever to a non-European organization. In 2006, Blue Star Infotech was provided the 'Gold Certified Partner' status by Microsoft and also became a member of the Global Services 100 list of service providers. It was awarded the **"Oracle Partner of the Year"** award for Customer Centricity in applications for the year 2006 - 2007.

Table 5.25

Financial performance of Bluestar Infotech Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	35.56	52.21	63.49	80.86	83.93	64.86	79.86	109.73	127.33	105.52
Sales growth (%)	...	46.82	21.61	27.36	3.80	-22.72	23.13	37.40	16.04	-17.13
Net earnings (in crores)	6.33	12.34	16.86	19.37	10.08	5.45	7.59	5.01	13.13	13.94
Earnings growth (%)	...	94.94	36.63	14.89	-47.96	-45.93	39.27	-33.99	162.08	6.17
Operating profit margin (%)	21.68	25.12	30.71	26.19	19.15	12.97	11.51	6.52	19.35	10.36
Net profit margin (%)	17.80	23.64	26.56	23.95	12.01	8.40	9.50	4.57	10.31	13.21
Return On Investment (%)	24.60	38.83	41.94	39.19	18.74	9.57	12.66	8.08	19.71	17.61
Return On Equity (%)	29.33	41.81	47.56	45.80	24.01	14.14	14.53	8.26	20.43	18.04
Reserves (in crores)	89.71	92.11	97.54	112.19	130.79	155.09	195.34	245.92	349.50	473.69
Debt Equity ratio (times)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current ratio (times)	1.50	1.30	1.36	1.34	1.33	1.38	1.39	1.16	1.18	1.27
Market price per share (Rs.)	31.75	142.25	104.60	168.50	129.80	105.40	93.00	58.05	47.05	112.90
Book value per share (Rs.)	25.73	31.78	40.20	49.42	53.79	56.96	59.93	62.02	66.61	79.17
Earnings Per Share (Rs.)	6.33	12.34	16.86	19.37	10.08	5.45	7.59	5.01	13.13	13.94
Dividend Per Share (Rs.)	3.00	6.00	7.50	9.00	5.00	2.00	4.00	2.50	5.00	5.00
Price Earnings ratio (times)	9.22	31.02	18.93	13.09	12.55	19.64	17.22	5.87	3.07	6.98
Price to Book ratio (times)	1.23	4.48	2.6	3.41	2.41	1.85	1.55	0.94	0.71	1.43
No. of shares (in lakhs)	100	100	100	100	100	100	100	100	100	100
Dividend yield (%)	9.45	4.22	7.17	5.34	3.85	1.90	4.30	4.31	10.63	4.43

Source: Annual reports

Sales of Bluestar has increased from Rs.35.56 Crores(in 2001) to Rs.127.33 Crores (in 2009), albeit some short falls occurred in a couple of mid years(2006 and 2007). Similarly there is considerable reduction in sales revenue in 2010 also. In accordance with the fluctuation in sales both profit margins oscillated during the same period. Both return on capital employed and return on net worth fluctuated and eventually declined during the period. However in spite of the contraction in sales revenue, in 2010 the company is able to make 6.17 per cent growth in its net earnings which can be attributed to the efficient use of its cost management practices.

The financial conditions of Bluestar appear to be strong. At the close of the study period (in 2010) the debt content in its total capitalization found to be zero and similar is the situation in most of the years observed for the study. Current ratio of the company declined from 1.57 to 1.27 times which can be partially connected to the policy of the company to make payment of dividend regularly.

On considering the relatively good performance of the company during the days when most of its peers unable to find rhythm in their business, it is rational to presume that the company has good potential to grow further. The company has paid dividend over the years of the study almost in a consistent fashion, which guarantees its investors to a regular income despite the consequences of the changes in economic cycle. Book value of its shares almost tripled during the period of study. Analysis of P/E and P/B ratio shows that the market price of Bluestar Infotech has not received growth in parity with the surge in its EPS and book value yet. So further consolidation and improvement in its fundamentals shall push up its price to new heights and investment in it definitely will be more rewarding then.

5.6.26: GTL Ltd.

GTL Limited, a Global Group enterprise was registered on 23rd December 1987 as a private limited company under the name of GTL Tele-Systems Pvt. Ltd. It became a public limited company in 1992 and its name was changed to GTL Ltd. in 2001. GTL is a leading Network Services company, offering services and solutions to deal with the Network Life Cycle requirements of Telecom Carriers and Technology providers (OEMs) and it operates in over 35 countries with its solutions in the wireless communications space from 2G networks to 3G and 4G. Its services include Network Planning and Design, Network Deployment, Network Operations and Maintenance, Infrastructure Management, Energy Management and Professional services. The Worldwide Offices are situated in USA, UK, Middle East, India, Bangladesh, Mauritius, Singapore, Sri Lanka, Thailand, Nigeria, UAE, Oman, Qatar, Australia and South Africa.

GTL Ltd. has made several corporate acquisitions (SCS, ADA Cell works etc.) at global level and has strategic alliances with some of the leading players in Information Technology/Telecom sector (Ericsson, UK, Vanu Inc etc…) there. In 2002, GTL's Call Centre division ranked third in the ITES sector by NASSCOM. GTL won the Golden Peacock National Quality award in the year 2003 and Golden Peacock Global award for corporate governance in 2007.

Table 5.26

Financial performance of GTL Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	814.82	532.81	586.86	479.93	544.52	649.74	691.59	1433.33	1450.90	1551.33
Sales growth (%)	-	-34.61	10.14	-18.22	13.46	19.32	6.44	107.25	1.23	6.92
Net earnings (in crores)	433.01	109.86	77.14	79.13	105.78	71.80	43.03	106.61	109.77	158.36
Earnings growth (%)	-	-74.63	-29.55	2.24	33.68	-32.12	-44.32	203.38	-24.61	73.18
Operating profit margin (%)	34.86	27.71	31.97	34.82	34.21	19.85	12.80	16.00	16.68	17.12
Net profit margin (%)	53.14	20.62	13.14	16.49	19.43	11.05	6.22	7.44	7.57	10.21
Return On Investment (%)	33.29	8.17	5.46	5.95	7.29	8.00	4.16	11.54	11.13	13.86
Return On Equity (%)	73.97	18.50	18.88	19.12	17.88	8.99	4.66	15.29	11.72	9.78
Reserves (in billions)	12.24	12.72	13.42	12.58	13.76	8.11	9.38	8.29	8.91	10.46
Debt Equity ratio (times)	0.002	0.037	0.056	0.11	0.3	0.3	0.79	0.76	1.03	2.07
Current ratio (times)	8.29	8.78	5.76	5.51	5.11	2.26	2.96	1.67	1.84	3.83
Market price per share (Rs.)	162.2	104.65	52.95	80.9	97.95	146	135.2	251.6	239.6	409.45
Book value per share (Rs.)	289.97	189.85	199.5	186.48	195.62	104.83	106.4	97.67	104.1	118.1
Earnings Per Share (Rs.)	98.77	15.47	10.89	11.1	14.27	8.39	4.42	11.27	11.59	16.37
Dividend Per Share (Rs.)	3.00	1.00	1.20	1.50	1.80	20.00	2.50	3.00	3.00	3.00
Price Earnings ratio (times)	1.64	6.76	4.86	7.29	6.86	17.40	30.59	22.32	20.67	25.01
Price to Book ratio (times)	0.56	0.55	0.27	0.43	0.50	1.39	1.27	2.58	2.30	3.47
No. of shares (in lakhs)	437.24	707.46	707.93	712.78	741.30	855.70	973.17	945.74	947.23	967.24
Dividend yield (%)	1.85	0.96	2.27	1.85	1.84	13.70	1.85	1.19	1.25	0.73

Source: Annual reports

Table 5.26 gives a brief account of the financial performance of GTL ltd. during the 10 years of the study. One of the features of GTL Ltd noticed by the analysis is that the company is able to maintain study growth in its sales revenue especially from 2004 onwards. It is also interesting to note that the company could maintain the growth in revenue even during 2009 and 2010, the recessionary years. But the company is not able to gain that momentum at the same scale in its net earnings as the trend of which found erratic and inconsistent during the period under reference. This is on account of increased amount of non operating expenses including financial charges which consumed a larger portion of its sales revenue. The impact of fluctuations in net earnings is also visible in its erratic movement of profit margins. Even though the profit margins declined heavily earlier years, the leveraging practices somewhat helped the company to reserve a sizable portion of its earnings for the shareholders.

Again the current ratio of the company has deteriorated from 8.9 in 2001 to 1.67 in 2007 and then improved and consolidated to 3.82 in 2010. Even though liquidity position of the company is relatively good in almost all years of the study, its trend is relatively alarming and indicates the weakening position of its liquidity. With regard to long term solvency, its debt equity ratio is increasing year after year. In 2001, it has almost zero debt in its capital structure, which increased and crossed the standard of 2:1 in 2010. Total capital employed by the company has increased more than 250 percent during the period of study. In this financing process the interest of outsiders terribly went down. Although long term solvency is established,

it is thinning down and is a serious matter in the light of bad liquid conditions. However increasing trend in its sales revenue to an extent can resolve these worries.

The company has paid dividend in all the years considered under study. In fact, for the last three years it has been pursuing the dividend policy of paying a constant dividend of Rs. 3. Its shares are traded at premium Price Earnings multiple and its Price Book ratio is improving year by year. Stable growth in sales and earnings enabled GTL to hedge its stocks against recessionary pressures. The outstanding performance of the stock during recession as well as its following year signals the terrific opportunities for investors to earn super return from the investment in stocks of GTL Ltd.

5.6.27: Tata Elxsi Ltd.

Tata Elxsi Ltd, the product design arm of the multi-billion Tata Group, is a company focused on delivering outsourced product design and R&D services and solutions to customers worldwide. The company provides systems integration and software development services in the information technology field. The company is having their state-of-the-art design centers in Bangalore, Mumbai, Pune, Hyderabad, Coimbatore, Chennai and Thiruvanathapuram.

Tata Elxsi Ltd was incorporated in the year 1989 as Tata Elxsi (India) Ltd and commenced their business on May 5th of that year. They undertook the role of being the central point for the entry of the Tata into

high-technology fields by promoting new projects and companies in communications, oil fields services, process control, management systems, financial services, advanced materials and composites. From Automotive to Aerospace, Enterprise to consumer electronics, Entertainment to FMCG Media to Storage, Semicon to Telecom Tata Elxsi provides customized design solutions to companies across the globe.

The Company operates in two segments, namely Software Development and Services, and Systems Integration and Support. The businesses constituting Software Development and Services segment are embedded product design services (design and development of hardware and software), innovation design engineering (mechanical design with a focus on industrial design) and visual computing labs division. Systems Integration and Support offers a range of technical computing solutions spanning high-end computing platforms, networking, mechanical design automation tools, enterprise storage solutions and digital media and life sciences solutions through their tie-ups with global leaders in these respective areas. The company has their operations in most part of the developed world such as US, UK, Germany, Canada, Japan etc.

Table 5.27

Financial performance of Tata Elxsi Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	136.74	129.81	109.60	153.48	185.77	235.63	307.96	401.55	418.52	376.37
Sales growth (%)	...	-5.07	-15.57	40.04	21.04	26.84	30.7	30.39	4.23	-10.07
Net earnings (in crores)	13.86	16.75	11.69	17.55	26.29	34.33	52.12	52.67	58.11	47.91
Earnings growth (%)	...	20.85	-30.21	50.13	49.80	30.58	51.82	1.06	10.33	-17.55
Operating profit margin (%)	18.65	19.69	19.50	17.51	21.55	22.20	25.99	22.31	22.42	23.29
Net profit margin (%)	10.14	12.90	10.67	11.43	14.15	14.57	16.92	13.12	13.88	12.73
Return On Investment (%)	38.60	56.19	41.60	50.47	66.01	69.48	73.13	42.61	47.40	30.56
Return On Equity (%)	36.26	40.02	26.12	36.37	48.06	52.06	56.31	44.28	38.34	27.54
Reserves (in crores)	7.08	10.71	13.81	17.11	23.56	34.8	61.42	87.82	120.42	142.84
Debt Equity ratio (times)	0.50	0.05	0.05	0.00	0.00	0.00	0.00	0.47	0.09	0.20
Current ratio (times)	2.12	1.59	1.82	1.48	1.29	1.22	1.24	1.84	1.76	2.43
Market price per share (Rs.)	70.35	77.05	65.95	79.30	183.80	193.20	290.15	158.05	82.20	319.95
Book value per share (Rs.)	12.27	13.44	14.37	15.49	17.57	21.18	29.72	38.20	48.67	55.87
Earnings Per Share (Rs.)	4.45	5.38	3.75	5.63	8.44	11.02	16.74	16.91	18.66	15.39
Dividend Per Share (Rs.)	2.50	3.50	2.50	4.00	5.50	6.50	7.00	7.00	7.00	7.00
Price Earnings ratio (times)	28.89	13.08	20.50	11.71	9.40	16.68	11.54	9.35	8.45	5.35
Price to Book ratio (times)	5.73	5.23	5.36	4.26	4.51	8.68	6.50	7.60	3.25	5.73
No. of shares (in lakhs)	311.38	311.38	311.38	311.38	311.38	311.38	311.38	311.38	311.38	311.38
Dividend yield (%)	3.55	4.54	3.79	5.04	2.99	3.36	2.41	4.43	8.52	2.19

Source: Annual reports

Table 5.27 presents the financial results of Tata Elxsi Ltd during the ten years of the study. Both sales revenue and net earnings of the company has made continuous improvement during the study period (except in 2010). Both rates of return measures were incredibly high until 2010. Tata Elxsi has the highest return on capital invested compared to its peers in the sample. However there has been marginal decrease in this rate during later years of the study.

The short term solvency position of the company is not much satisfactory as its current ratio steadily declined during the period and in almost all years it was much less than the standard specified for this. Being a service concern maintaining such a higher standard may not be mandatory. If we come to the leverage ratio, its debt equity ratio is much below the average throughout the period, despite slight increase in it during the last few years. This highlights low risk nature of the firm. Dividend per share has increased from Rs.2.5 in 2001 to Rs.7 in 2010. It is paying dividend consistently over the years which are very important for some investors who demand a regular income from their investments.

Although the stocks of Tata Elxsi is giving benefits to the shareholders through better capital appreciation (due to upturn in its share prices in the market) they are most volatile in many years. Investment ratios such as Price earnings ratio and price book value ratio give a glossy picture of the organization among the investors. When Price Earnings ratio has declined from 28.89 times in 2001 to 5.30 times in 2010 and its contraction

was almost steady and constant especially during the last 5 years of the study regardless of the market conditions prevailing there. When we club these finding with trend persisting in its Earning Per Share and book value of a share, it is reasonable to say that the reduction in Price earnings ratio is not a sign of lack of investor confidence, instead its value has not fully reflected in the market price of its stock, hence it is undervalued and a lot of chances to surge to a level which exhibits true reflection of its fundamentals. For capitalizing such opportunity it needs to be seen whether the company can retain its growth streak on higher revenue and profits in the years to come. The stable dividend policy of the company is commendable and is likely to have a salutary effect on its market price.

5.6.28: RS Soft Ltd.

Incorporated on 2 Dec.'87, public in 1992, R S Software produces customized commercial application software as per specific needs and requirements of customers. The company has developed capabilities in the areas of client/server and object oriented technologies. The company is executing projects using Internet and New Technology Group technologies. Its range of activities includes on-site consultancy, offshore projects and software products. The company has made strategic alliances with reputed companies from Europe, US and Asia pacific region.

Table 5.28

Financial performance of RS Softwares Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	100.81	58.67	60.61	59.57	81.69	91.57	101.04	100.36	149.57	161.89
Sales growth (%)	...	-41.80	3.31	-1.72	37.13	12.09	10.34	-0.67	49.03	8.24
Net earnings (in crores)	12.95	-24.14	-19.46	-8.84	-1.49	5.93	4.85	1.17	6.32	9.56
Earnings growth (%)	...	-286.41	-19.39	-54.57	-83.14	-497.99	-18.21	-75.88	440.17	51.27
Operating profit margin (%)	20.27	-11.83	20.33	12.31	19.12	19.34	15.32	10.33	12.99	13.18
Net profit margin (%)	12.84	-41.13	-32.08	-14.83	-1.82	6.47	4.78	1.15	4.21	5.91
Return On Investment (%)	25.79	-55.73	-35.75	24.03	62.18	67.26	41.84	30.72	59.08	
Return On Equity (%)	27.55	-14.51	.	.	.	.	31.73	19.16	40.86	
Reserves (in crores)	36.52	11.66	-7.07	-15.90	-17.38	-11.45	6.98	5.26	10.65	19.96
Debt Equity ratio (times)	0.58	1.16	8.81	-6.46	-4.37	-26.7	0.86	0.86	0.39	1.05
Current ratio (times)	10.16	1.46	2.14	2.28	2.51	.37	3.38	2.79	1.89	2.10
Market price per share (Rs.)	64.4	44.55	19.35	14.35	41.45	75.25	52.2	21.3	11.45	39.2
Earnings Per Share (Rs.)	26.28	-50.45	-39.59	-17.97	-3.03	12.06	6.52	1.57	8.25	11.80
Book value per share (Rs.)	84.31	33.73	4.39	-22.35	-25.33	-13.27	19.39	17.07	23.89	35.15
Dividend Per Share (Rs.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Price Earnings ratio (times)	2.45	-0.88	-0.49	-0.80	-13.68	6.24	8.01	13.57	1.39	3.32
Price to Book ratio (times)	0.76	1.32	4.41	-0.64	-1.62	-5.67	2.69	1.25	0.48	1.12
No. of shares (in lakhs)	49.14	49.14	49.15	49.16	49.18	49.18	74.35	74.45	76.65	81.08
Dividend yield (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Annual reports

The financial performance of RS Softwares Ltd (RS Soft) found abnormally poorer than that of other selected firms in the I.T industry till the financial year ended 2005. All the financial performance indicators were negative until then. But the continued focus on a single domain, electronic payment industry from 2006 onwards and aligning the sales and marketing investments with this are helping the company to increase the quality of revenues thereby brought it in to the profit zone through the effective implementation of strategic cost management initiatives. So the strong turnaround is visible 2005-06 onwards. Its revenues from sales operations and the resultant earnings have increased considerably, profit margins have become positive, net worth base has widened and the return measures have been at staggering rate. During the financial year ended 2010, when the NASSCOM industry growth has been lowest in years, averaging around 7 per cent, RS Software has achieved a growth rate of 12 percent in operating profit terms (Annual report 2010).

There has been considerable improvement in the financial solvency position of Rs Soft as indicated by the trend in its debt equity ratio. Such a consolidation in its financial structure is achieved by maintaining a crucial balance between debt reduction levels and making investments from internal accruals. Current ratio of the company has been improving consecutively which indicates the reinforcing liquidity position of the company.

Even though the Earning per Share of the company has increased during the last 5 years, there has not been any shift in the dividend policy of the company. The company has not made any dividend payment so far. Its relatively low price earnings ratio and oscillating price to book value measure indicates that the investors are still skeptical in choosing its scrip as

a channel for their investment.. But when we look in to the growth trend of Electronic Payment industry it seems to grow double digits annually as cheque and cash transactions continue to get digitized. This is driving the demand for creative digital solutions to this industry. If the company like Rs soft is come up with apt business strategies in order to leverage this growth opportunity delivered by the payment industry, the investors shall definitely find the investments in the stock of Rs soft more fruitful and promising.

5.6.29: Cura Technologies Ltd. (Softpro)

Cura Technologies Ltd formerly known as Softpro Systems Ltd is an embedded technology solutions provider for the energy sector. Headquartered in Hyderabad, India, Cura was established in the year 1994. The company primarily focused on providing enterprise and collaborative solutions and diversified IT services. Now the company expands its expertise from technology solutions to cutting-edge products that serve fast-growing markets such as technology solutions for Governance, Risk and Compliance (GRC) enterprise applications. US constitute Cura's major overseas market.

Both sales and earnings of the company improved during the period of the study after larger fluctuations during the mid years (Table 5.29). Even though its operating margin is not much commendable, the net profit margin improved much especially during the last three year period. In 2010 the company has made its ever time high sales of Rs.10.11 Crores which mainly contributed by the spike in its income from other sources. The main sources of income to the business especially after 2005 are non operating sources which is one of the prime reasons for having relatively high net profit margin over operating profit margin. The operating profit margin did not show any noticeable change during the study period.

Table 5.29

Financial performance of Softpro Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	1.41	0.99	1.34	3.6	2.34	3.50	2.94	1.51	0.68	10.11
Sales growth (%)	...	-29.79	35.35	168.66	-35.00	49.57	-16.00	-48.64	-55.00	1386.80
Net earnings (in crores)	0.69	0.14	0.17	0.45	1.44	1.25	6.05	2.16	1.78	2.85
Earnings growth (%)	-	-79.71	21.43	164.71	220.00	-13.19	384.00	-64.30	-17.60	60.11
Operating profit margin (%)	-24.82	-24.24	5.22	-11.94	-39.32	-28.57	-67.69	-87.42	-307.00	0.10
Net profit margin (%)	48.94	14.14	12.69	12.5	61.54	35.71	205.78	143.05	262.00	28.19
Return On Investment (%)	48.94	14.14	12.69	12.50	61.54	35.71	205.78	143.05	26.30	28.19
Return On Equity (%)	51.06	15.15	14.18	25.56	93.16	56.86	35.37	203.97	40.90	42.93
Reserves (in crores)	12.16	12.21	12.24	12.51	13.33	14.41	14.66	16.22	17.70	28.70
Debt Equity ratio	0.00	0.02	0.13	0.26	0.22	0.21	0.15	0.08	0.00	0.20
Current ratio	21.16	12.63	3.86	3.32	2.90	3.64	3.16	2.61	1.93	3.69
Market price per share	10.10	8.10	8.50	8.90	42.75	47.70	51.85	170.55	54.50	263.00
Book value per share	30.25	30.33	30.40	30.85	32.21	34.02	34.44	37.04	39.50	51.44
Earnings Per Share	1.15	0.23	0.28	0.75	2.40	2.09	10.08	3.60	2.96	4.12
Dividend Per Share	0.50	0.20	0.20	0.30	1.00	0.60	0.40	1.00	0.50	0.50
Price Earnings ratio	8.78	35.22	30.36	11.87	17.81	22.82	5.14	47.38	18.40	63.83
Price to Book value ratio	0.33	0.27	0.28	0.29	1.33	1.40	1.51	4.60	1.38	5.11
No. of shares issued	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	69.25
Dividend yield	4.95	2.47	2.35	3.37	2.34	1.26	0.77	0.59	0.92	0.19

Source: Annual reports

The solvency position of the Softpro is sound as its debt equity ratio was almost equal to zero in most of the years of the study period. Similarly liquidity position also appeared sound as indicated by the higher current ratio..

Over the past eight years (2003-2010) Softpro has sold at premium price earnings multiples relative to the industry. This has been the case in years of both good and bad earnings. Book value of the company steadily grew from Rs.30.25 per share in 2001 to Rs.51.44 in 2010. Increasing trend in its Price Earning multiple might be a sign of speculative interest of the traders with its stock. Even though the Earning per Share of the company wildly fluctuated, the company has declared and paid dividend over the years. Such irrational dividend policy might be one of the major reasons for the poor liquid conditions for the company.

5.6.30: Goldstone Technologies Ltd

Goldstone Technologies Limited, the Hyderabad based Information Technology and Business Process Outsourcing (BPO) services Company with a global presence is mainly developing IT solutions for electronics, telecom and film industries. The company was originally incorporated as a private limited company in 1994 and become public in the same year itself. The company has already entered in to business partnership with many corporate from India as well as from countries such as Japan, Italy, USA, Israel, Mauritius etc. The company has franchisee agreement with Indian telecom giant Bharath Sanchar Nigam Ltd. (BSNL).

Table: 5.30

Financial performance of Goldstone Technologies Ltd

Year ended	2001*	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	50.20	28.29	48.75	57.27	41.22	34.90	41.03	60.52	23.08	23.19
Sales growth (%)		-43.65	72.32	17.48	-28.03	-15.33	17.56	47.50	-61.86	0.48
Net earnings (in crores)	2.71	-12.81	0.51	3.86	1.63	0.90	7.55	11.56	0.97	0.42
Earnings growth (%)	-	-572.69	-103.98	656.86	-57.77	-44.79	738.89	53.11	-91.61	23.08
Operating profit margin (%)	7.03	-19.19	7.30	13.13	9.19	5.62	24.86	28.75	-21.32	30.62
Net profit margin (%)	5.40	-45.28	1.05	6.74	3.95	2.58	18.40	19.10	4.20	1.81
Return On Investment (%)	8.14	-48.63	11.57	21.34	7.01	5.54	18.00	16.52	2.45	1.94
Return On Equity (%)	6.97	-90.85	3.20	19.57	6.41	3.97	21.41	17.64	1.46	0.62
Reserves (in crores)	28.05	3.26	3.75	7.53	10.23	11.27	21.13	42.24	47.86	48.67
Debt Equity ratio	0.26	0.64	0.45	0.32	0.24	0.28	0.21	0.26	0.19	0.19
Current ratio	1.87	1.30	1.32	1.32	2.83	1.35	1.53	1.29	1.18	1.48
Market price per share	26.45	20.3	28.7	15.9	23.75	16.9	66.5	201.75	13.7	27.6
Book value per share	35.88	13.00	13.46	16.95	19.44	20.15	26.25	32.49	35.48	35.91
Earnings Per Share	6.72	2.5	-11.82	0.47	3.56	1.5	0.81	5.81	6.15	0.52
Dividend Per Share	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00
Price Earnings ratio	10.52	-1.72	61.00	4.45	15.83	20.86	11.45	32.80	26.35	125.46
Price to Book value ratio	0.74	1.56	2.13	0.94	1.22	0.84	2.53	6.21	0.39	0.77
No. of shares issued (lakhs)	108.38	108.38	108.38	108.38	108.38	111.01	130.01	187.82	187.82	187.82
Dividend yield	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00

Source: Annual reports   *Year ended June 2001

On comparing the sales data of Goldstone Technologies across years (Table 5.30), it reveals that unlike its peers in the industry, the company experiences its sales heavily fluctuate with the business cycles. Owing to thinness in income from non operating sources its net earnings directly varied with the changes in sales. As a result of the contraction in earnings, profit margins shrunk at an alarming rate. When we take in to account its overall profitability measures - rate of return on capital employed and rate of return on net worth, both of these measures are sagging year during the last two years which should be viewed as a negative sign of efficiency in asset management. Such an interpretation is made in the sense that its earning efficiency is not justified by the capital employed in the business.

The relative portion of debt funds in its capital structure is almost stable during the period of the study. The company is able to enjoy favorable financial leverage and the effect of which is visible in its growth in EPS and return on net worth during 2007 and 2008.

The emerging liquidity position of the company appears to be highly satisfactory and the company is unlikely to encounter any difficulty in paying its short term obligations as and when they become due for payment. The Price Earnings ratio of the company has fluctuated in most of the years. Even though the book value of the shares increased over the years, the growth is not much appreciating compared to the peers. The company has proved conservative in its dividend payment.

5.6.31: Cybertech Systems and Software Ltd.(CSSL)

Cybertech Systems and Software Limited (CSSL) was incorporated on 19th January, ---- as a Public Limited Company under the Companies Act, 1956. Headquartered in Mumbai, the main object of the Company is to undertake software Development for overseas market. The company is providing on-site technical services at the client's location (basically in the U.S.A.), undertake turnkey Projects and develop operations in India. The company is tied-up with SAP Arabia to provide technical and functional services to SAP customers in the middle-east. The company has foothold in ERP (SAP) implementation also.

Table: 5.31

Financial performance of Cybertech Technologies Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	27.85	8.11	8.52	6.71	6.66	9.22	16.33	16.32	12.75	12.43
Sales growth (%)		-70.88	5.06	-21.24	-0.75	38.44	77.11	-0.06	-21.88	-2.51
Net earnings (in crores)	2.72	-18.92	-21.00	-4.54	-0.60	4.41	7.05	2.90	6.86	4.38
Earnings growth (%)	-	-795.59	-10.99	78.38	86.78	835.00	59.86	-58.87	136.55	-36.15
Operating profit margin (%)	15.26	-47.84	-51.64	-27.57	3.75	4.34	10.47	9.93	6.75	1.05
Net profit margin (%)	9.77	-233.29	-246.48	-67.66	-9.01	47.83	43.17	17.77	53.80	35.24
Return On Investment (%)	3.38	-31.32	-53.27	-13.02	-1.75	11.40	15.67	6.18	13.54	8.43
Return On Equity (%)	5.33	-31.41	-52.23	-12.15	-2.22	4.67	11.49	7.13	15.51	11.92
Reserves (in crores)	57.32	37.23	16.23	11.69	11.09	15.50	20.06	20.43	24.20	25.48
Debt Equity ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current ratio	2.58	1.11	0.76	1.24	1.35	1.55	1.95	3.18	2.62	1.58
Market price per share	17.95	18.9	17.10	9.70	10.00	10.85	20.65	16.05	8.45	18.65
Book value per share	34.73	26.06	17.00	15.04	14.78	16.68	18.12	17.72	19.14	19.63
Earnings Per Share	1.17	-8.16	-9.06	-1.96	-0.26	1.90	2.85	1.10	2.59	1.66
Dividend Per Share	0.80	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00
Price Earnings ratio	15.34	-2.32	-1.89	-4.95	-38.46	5.71	7.25	14.59	3.26	11.23
Price to Book value ratio	0.52	0.73	1.01	0.64	0.68	0.65	1.14	0.91	0.44	0.95
No. of shares issued (Lakhs)	231.82	231.83	231.85	231.92	247.00	264.71	264.71	264.71	264.71	264.71
Dividend yield	4.46	0.00	0.00	0.00	0.00	0.00	4.84	6.23	11.83	5.36

Source: Annual reports

When we analyze the financial results reported by Cybertech Technologies (Table 5.31), it is interesting to see that there was substantial difference in the performance of the company during two successive periods (2001 to 2005 and 2005 to 2010). Both sales and earnings position of the company were abnormally poor during the first 5 year period and all of its profit measures found negative at this stage. But during the next time span corporate turnaround is visible and all of its profit indicators have reached its positive zone. Operating efficiency of the company is relatively high and its profit margins more than 50 per cent during this period.

Both short term and long term solvency positions of Cybertech have made stronger during second half of the study period due to widening equity base as well as good operating results. The debt content in its capital structure is marginal and current ratio is on above average. Price Earnings ratio is fluctuating and Price to Book value ratio is still at lower scale which makes us to believe that its stock is yet to win the confidence of the investors.

5.6.32: Computech International Ltd.

Calcutta based Computech International was incorporated on 31st July, as Computech Ispat Ltd. The Company is engaged in various types of activities such as Software development and data processing, Import and Export of computer hardware and software etc. The company has its business operations in USA, U.K, Middle East and South East Asia. In 2000, the Company entered in to Oracle-based ERP software development and business re-engineering. The company is tied up with US-based Bell Incorporation to manufacture personal computers for the middle class segment of the country.

Analysis of financial data published by Computech Ltd (Table 5.32) reveal that both sales and earnings of the company showed erratically up and down during the period between the years ended 2001 and 2008. But later its sales position found pitiably low, on account of which amount realized by the company from its business operations were not sufficient even for meeting its cost of operations. As a result, the company has incurred huge amount of losses consecutively.

Table: 5.32

Financial performance of Computech Ltd

Year ended 31st March	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales (in crores)	116.55	97.74	120.52	118.1	104.52	107.42	122.42	39.98	26.46	0.39
Sales growth (%)	-	23.31	-2.01	-11.50	2.77	13.96	-67.34	-33.82	-98.53	-16.14
Net earnings (in crores)	13.74	0.74	2.20	1.23	5.91	2.10	3.01	-9.24	-96.80	-26.89
Earnings growth (%)	-	-94.61	197.30	-44.09	380.49	-64.47	43.33	-406.98	-947.62	72.20
Operating profit margin (%)	18.63	7.42	7.55	7.57	6.84	4.85	5.82	-17.41	-355.62	-5643.59
Net profit margin (%)	11.70	0.74	1.81	1.03	5.63	1.94	2.45	-22.53	-362.63	-6874.36
Return On Investment (%)	15.39	0.88	2.55	1.41	6.54	2.27	3.16	-10.73	-	-
Return On Equity (%)	19.29	4.38	3.85	2.02	5.89	4.38	5.60	-6.45	-	-
Reserves (in crores)	77.78	72.50	74.70	75.93	78.85	80.83	83.84	74.63	-22.17	-49.00
Debt Equity ratio	0.11	0.15	0.18	0.10	0.11	0.11	0.14	0.10	-3.25	-
Current ratio	3.26	3.09	3.69	2.60	3.16	2.50	1.74	1.71	2.88	0.69
Market price per share	12.65	9.35	4.55	5.75	8.70	5.80	7.35	5.60	2.80	3.25
Book value per share	38.76	36.46	37.42	37.95	39.22	40.08	41.39	37.39	-4.62	-16.29
Earnings Per Share	5.96	0.32	0.96	0.54	2.56	0.91	1.31	-4.01	-42.01	-11.67
Dividend Per Share	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Price Earnings ratio	29.22	4.74	10.65	3.40	6.37	5.61	-	0.15	-	-
Price to Book value ratio	0.33	0.26	0.12	0.15	0.22	0.14	0.18	0.15	-	-
No. of shares issued (lakhs)	230.42	230.42	230.42	230.42	230.42	230.42	230.42	230.42	230.42	230.42
Dividend yield	1.98	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Annual reports

The repeated losses incurred by the company caused larger amount of capital erosion to Computech and now its accumulated losses is much exceed its equity capital, the situation of which raises big concern for its owners and lenders alike. Existence of poor operating conditions made its liquidity position vulnerable which poses big problems to its short term creditors.

The impact of negative returns from capital employed in the business and also the after effects of watered stock position are clearly visible in the price movement of Computech. In real sense, stocks of no other companies in the group are traded at such an abnormally low price in the market.

Thus from the facts revealed by the financial statement analysis we can say that the financial performance of corporate firms and their stock prices are closely related. Good earning conditions, strong net worth base, profitable products and assets portfolio of all are factors seem to significant in determining investor confidence and stock prices in India. The shadow of global economic recession continued to haunt many of the firms in the IT industry. But continuing business activities in the space of software development, communication and networking, which has immense potential within and outside the country, we can be hopeful that the reduction in revenues of IT firms especially during the last two years will only be a temporary phenomenon.

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Chapter 6

CORPORATE PERFORMANCE AND STOCK RETURNS – A STATISTICAL ANALYSIS

6.1: Introduction

Equity investment generally refers to the buying and holding of stock on a stock market by individuals and funds in anticipation of future income. The primary motive for buying a stock by an investor is to sell it subsequently at a higher price. Each stock is assumed to have an economic worth based on its earning capacity in future. Apart from performance of the economy and the industry the performance of individual firms shall also affect their earnings there by movement of its stock prices. So once he successfully identifies the key economic variables which cause general stock price movement in a country and the relevant industry variables which have significant explanatory power in explaining the variability of stock returns, the next prime job of a security analyst is to examine the specific company factors which can measure the strength and promise of future prospects in an individual firm. Some of these factors are of purely

financial/quantifiable nature and some others are of purely qualitative. As far as a security analyst is concerned he may give more importance to the factors relating to the financial aspects of business revealed by the accounting data published by firms and they make use of these data in assessing the economic prospects of the firms.

Financial ratio analysis is of immense help in security analysis for evaluating critically the information contained in the financial statements of firms in order to understand their working and financial positions and also to make decisions with regard to the investment in their stocks. They make use of these ratios to explore the sources of a firm's profitability and evaluate the quality of earnings in a systematic fashion. But the financial ratios as such are not a tool in uncovering mispriced securities. They only reveal the performance of firms during the past years. For an investor what is more important is the future performance of the company and not its past achievements. However in normal situations the past is the sole basis for the forecast of the future. So from the analysis of past performance of the firms, the analyst can forecast the future prospects of the company and his investment decision would depend upon such forecast. For having the most precise forecast or estimate about the future, he should be more systematic and scientific. Use of standard statistical tools enable the security analysts to make the best estimate for the future financials of the firm in which he intends to invest his savings.

Before going for any type of forecasting, especially forecasting of future stock returns first of all the analyst has to identify its broad determinants from the list of variables available to him. After identifying the key financial factors which specifically influence the prices of individual stocks, he should ascertain the nature of relationship between these factors and the stock returns. Measurement of such relationship definitely help him to gauge the simultaneous impact of determinant variables on the stock return which further help him to have the best estimate of the future stock price. All these steps can be effectively completed only through a scientific statistical process.

6.2: Data and Methodology

For the purpose of statistical analysis of stock returns and company financials the study has chosen twelve exploratory financial variables. The variables which the study chooses to use stem from both existing literature (Das and Pattanayak 2007) and intuitive knowledge of the data. Therefore, the study uses the EPS, earnings growth, Return on Equity(ROE), Return on Capital Employed(ROCE), Debt to Equity ratio, Beta (market risk premium), Earnings to Price ratio or Earnings yield(E/P), Book Value per share (BV), Price to Book value ratio (P/B), Market Capitalization (MC), Dividend yield and Average stock return (AR). A security analyst must consider these factors while he assesses the real worth of a share.

The empirical analysis made in this section involves an exploratory factor analysis and a regression modeling under Ordinary Least Square

(OLS) method. Exploratory factor analysis is employed to discover the common factors or latent variables among the observed company financial variables. This technique is administered here mainly for identifying the company financials firms, the variation of which is more significant in explaining the variation of its stock returns. OLS regression technique is employed to measure and estimate the cross sectional relationship between those determinant variables and stock returns. The methodology which the study follows while employing these statistical techniques and its explanations in detail is given along with the results and discussions.

6.3: Results and Discussions

6.3.1: Factor analysis

In exploratory Factor analysis administered in the study we are interested in exploring the dimensions that could have caused correlations among the observed company fundamental variables. The factor extraction method of Principal Component Analysis was opted to identify the critical factors.   In PCA variables must be correlated to each other for the factor model to be appropriate. So a correlation co efficient matrix of selected variables was prepared at first for deciding the feasibility of PCA to the collected financial data and then a test given by Kaiser –Meyer – Olkin (KMO) and Bartlett's is applied to test whether the sample variables are adequate for factor analysis. The correlation matrix and the results of KMO –Bartlett's test are reported in Table 6.1 and Table 6.2 respectively.

Table 6.1

Correlation matrix of company financial variables

	EPS	Earnings growth	ROE	ROCE	Debt Equity	Beta	E/P	BV	P/B	MC	Dividend yield	AR
EPS	1.00	0.07	*0.30	*0.32	-0.20	0.10	0.12	*0.52	*0.76	*0.55	0.03	0.08
Earnings growth	0.07	1.00	*0.29	0.14	-0.12	-0.05	*0.46	-0.11	0.02	0.01	0.01	*0.36
ROE	*0.30	*0.29	1.00	*0.76	-0.22	0.01	*0.34	-0.01	*0.25	0.17	0.04	0.17
ROCE	*0.32	0.14	*0.76	1.00	-0.24	0.01	0.19	0.00	*0.30	0.19	0.02	0.22
Debt Equity	-0.20	-0.12	-0.22	-0.24	1.00	-0.24	-0.14	0.01	-0.15	-0.11	-0.10	-0.03
Beta	0.10	-0.05	0.01	0.01	-0.24	1.00	0.04	0.07	0.18	-0.05	-0.05	-0.10
E/P	0.12	*0.46	*0.34	0.19	-0.14	0.04	1.00	0.08	0.12	-0.08	0.14	.07
BV per share	*0.52	-0.11	-0.01	0.00	0.01	0.07	0.08	1.00	*0.47	*0.47	-0.01	.06
P/B	*0.76	0.02	*0.25	*0.30	-0.15	0.18	-0.08	0.12	1.00	0.38	-0.06	0.00
MC	*0.55	0.01	0.17	0.19	-0.11	-0.05	-0.08	*0.47	*0.38	1.00	-0.09	-0.01
Dividend Yield	0.03	0.01	0.04	0.02	-0.10	-0.05	0.14	-0.01	-0.06	-0.09	1.00	0.03.
AR	0.08	*0.36	0.17	0.22	-0.03	-0.10	0.07	0.06	0.00	-0.01	0.03	1.00

*Correlation Coefficient greater than or equal to 0.25 and significant at one per cent level

The correlation matrix illustrates the extent to which the selected twelve financial variables are correlated pair wise in a matrix. Out of 60 cells below the main diagonal there are only fourteen correlation coefficients (shown in boldface letters) above or equal to 0.25 which are also statistically significant (at one per cent level) and different from zero.

Table 6.2

KMO and Bartlett's Test of sphericity

KMO measure of Sampling Adequacy.	Bartlett's Test of Sphericity (Approx. chi square value)	p value
0.5469	582.4	0.000*

*Significant at one per cent level

The KMO statistic reported in Table 6.2 represents the ratio of the squared correlation between the variables to the squared partial correlation between those variables. The KMO statistic varies between 0 and 1. Kaiser (1974) recommends values greater than 0.5 as acceptable. For the data used in this study the value is 0.5469, and so the researcher believes that the factor analysis is appropriate for the data.

Bartlett's measure tests the null hypothesis that the original correlation matrix is an identity matrix. If the correlation matrix is an identity matrix, all correlation coefficients would be zero. For factor analysis to work there should be some relationship between the variables and hence the correlation matrix should not be an identity matrix. Therefore, there are some relationships between the variables we hope to include in the analysis. For the data used in this study, Bartlett's test is highly significant ($p<0.001$), and therefore factor analysis is appropriate for this study.

After testing the adequacy of the data and the explanatory variables, factor analysis is undertaken with those twelve company financial variables. For determining the number of factors which are needed to represent the financial data, Eigen values have estimated. The Eigen values associated with each factor represent the variance explained by that particular linear component. By following Kaiser's rule of retaining factors with Eigen values greater than unity, five factors have extracted from the data. The proportion (per cent) of variance explained by each factor is shown in Table 6.3, indicating that these five factors altogether account for 69.48 per cent of the total variance. To have better interpretability of factors, the orthogonal factor rotation method – Varimax is used.

Table 6.3

Varimax Rotated Factor Loading Matrix (2001-2010)

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
EPS	**.854**	.296	.044	.174	.014
Earnings growth	-.043	.137	**.837**	.047	-.060
ROE	.086	**.836**	.276	.062	.076
ROCE	.119	**.885**	.125	.029	.026
DE	-.054	-.285	-.077	**-.617**	-.173
Beta	.038	-.096	-.047	**.844**	-.155
E/P	-.001	.075	**.692**	.250	.357
BV per share	**.790**	-.276	.110	-.019	.135
P/B	**.592**	.429	-.174	.233	-.210
MC	**.779**	.135	-.045	-.089	-.079
Dividend Yield	-.020	.056	-.029	-.023	**.904**
AR	.061	.157	**.589**	-.271	-.161
Eigen values	3.023	1.908	1.686	1.319	1.097
Variance explained in (%)	23.25	14.68	12.97	10.14	8.44
Cumulative (%)	23.25	37.93	50.9	61.04	69.48

6.3.2: Factor identification and its Interpretation

The discussions made in the following paragraphs shall unfold the picture of the groupings of company financials pertaining to the firms sampled under study based on their co movement. They also identify the critical financial variables which have significant effect on the movement stock prices in Indian stock market.

Factor 1 – Size and Growth factor: This factor consists of EPS, book value per share, market capitalization and price - book ratio. This factor is positively loaded in favor of all of these four variables and represents the size and growth potential of firms in the industry. Increased earnings encourage the firms especially the growth firms to retain more amount of its earnings for its further profitable investments which will enhance the total value of the equity and the corresponding asset base on the balance sheet ie book value. Improving book value shall attract more investors to the shares of such firms which push up its prices in the market there by it has higher Price book ratio. Rising share price means increased market capitalization or size of the firms.

Factor 2 – Profitability factors: This factor shows the operating as well as economic efficiency with which the firms are able to utilize the funds invested in its business. This factor consists of only two variables - return on capital employed and return on equity. This factor is positively loaded to both of these profitability measures. The increase in this factor indicates the more profitable use of investments with the company and has a favorable effect on its share prices and stock market movement. But the reverse situation results in the loss of investor confidence and market failures.

Factor 3 – Valuation factor: This factor indicates how well the securities are valued in the market, what determines its valuation and also the valuation outcome. So this factor can be termed as valuation indicators. This factor comprises of earnings yield (just reciprocal of Price Earnings ratio), earnings growth and average return. This component is positively loaded to all three variables. Growth in earnings leads to larger increase in Earnings Per Share(EPS) of firms compared to its market price of share (increase in earnings yield/decrease in price earnings ratio). An increase in this factor indicates that the company has high earnings per share, but the market price of the share is low which implies that the investment in share of such firm has good potential for growth in terms of capital appreciation in the near future as the share is undervalued at present in the market. An increase in this factor over a period of time has a positive effect on the share price, there by the investors could enjoy increased returns from their investments.

Factor – 4:- Risk and volatility factors: - This factor consists of beta and debt- equity proportion in the capital structure of sample firms. When beta indicates magnitude and direction of movement of equity shares with respect to the general market movement (proxy for market risk), the debt equity ratio is a measure indicating the possible variations in financial results of a firm under changing conditions of business (represent financial risk). This factor is positively loaded in favor of beta and negatively loaded in favor of debt equity ratio of firms. Negative loading of this factor with regard to the debt equity ratio as against its positive loading with market sensitivity truly consistent with the common notion in investment management (William R Lasher 2003) that when the economic outlook is good, at low to moderate level of debt in the capital structure of firms, the

investors value the positive effects of leverage a great deal and virtually ignore concerns about increased financial risks thereby the stock prices of such firms tend to rise at a rate higher than that of market index.

Factor – 5: Income Factor: - This factor is solely constituted by Dividend yield and is positively loaded with it. An increase in this factor indicates a high increase in dividend per share with respect to the market price. Even though this factor is an indicator of residual income distribution policy of firms, the absence of the significant correlation of this factor with any of the other eleven financial variables under study pose some problems in judging its impact on the price movement of firms' common stocks in the market. Such a situation indirectly validates the argument of dividend irrelevance in valuation of firms in Indian stock market conditions.

Among these factors which have identified through factor analysis, the valuation factor is more important as far as an equity investor is concerned. This is because the financial variables included in this factor can decide the major determinant variables which have a significant bearing on the stock price movement or stock returns in India. So these variables – earnings growth and P/E ratio (or earnings price rate) can be used as an effective tool to track the price behavior of the Information Technology stocks in the Indian stock market.

6.4: Price Earnings ratio –Key share valuation tool for the investment strategists

Investment strategies are largely based on selecting stocks that are cheap relative to some fundamental variables. Two ratios that make use of the market price of firms' common stock in addition to its financial statements are the ratios of Price to earnings (P/E ratio) and market to book

value (P/B ratio). P/E ratios are used to select stocks that are cheap relative to Earnings per Share and P/B ratios are to select stocks that are cheap relative to Book Value per share. Analysts sometimes take low values for these ratios as a margin of safety or sign that the stock is a bargain and occasionally consider higher values for these indicators as an index of investor confidence and optimism about the growth prospects of the firm and its investments. The investment strategies pursued in the former case are known as Value strategies and those in the latter situation are called Growth strategies. Value strategists suggest that an investor should choose the stocks with low ratio of market price share to earnings per share or to book value per share. These stocks are called value stocks because they have a low price relative to these two measures of value already undervalued in the market and have a chance to increase to its Fair value or true worth. In contrast the growth strategists force the investors to choose growth stocks – stocks with high Price Earnings ratio or Price Book ratio suggesting that investors in these firms must believe that the firm will experience rapid growth to justify the prices at which the stocks sell.

When we go through the available literature on the relative efficacy of one investment strategy over the other in terms of return, there seems to be a wide consensus among the academicians and practitioners alike on the fact that value strategies outperform growth strategies in many of the countries. It will also be worth to note that that both Value strategists and Growth strategists arguably use P/E ratio as the major instrument for their investment valuation process. Many investment advisory firms (For eg: Value line Investment company of Newyork) and money management firms use Low Price Earnings ratio as investment criteria with acknowledged success (Fischer Black 1973). Further several economic research and

Financial Analysts have published studies which advocate selection of stocks with low Price Earnings ratio. One of the pioneer study happened on this aspect is Basu (1977). His findings support the notion that on average, low PE stocks (value stocks) can earn better return than high PE stocks (growth stocks). Capaul et al (1993) report that value outperformed growth in the US, Japan and Europe by an average of 40 per cent over the period. In efficient markets under price out of favour (value stocks), and therefore investing them does eventually pay off (Lakonishok et al 1994). Dreman and Berry (1995) have found that analysts' errors have an asymmetrical impact on high and Low P/E stocks. Positive earnings surprises for worst stocks (Lowest P/E stocks) result in significantly above market returns but have a far more moderate impact on 'best' stocks(Highest P/E stocks). Similarly negative surprises on best stocks result in significantly below market returns, with only a minor impact on worst stocks. Bauman et al (1998) extend the previous study by Capaul et al. (1993), in terms of time and coverage (21 countries) and confirm that value outperforms growth, though not necessarily in every country or every year. Many other reports are also consistent with these findings. Investments in fundamentally strong companies having Low P/E ratio do not lose the capital of its investors much during falling days, but eventually it makes huge profits for them during its subsequent recovery stage (Financial Express, Dhaka, Feb 19 2010). An empirical study conducted by Harikumar et al. (2010) in the context of India demonstrated the persistence of this trend during recent crisis and further recovery days. On consolidating the findings of these studies we can say that P/E ratio is always not fully reflected in security prices in many of the markets across the globe and the disequilibria persisted there helped a lot to the investors in earning excess returns.

As we have seen earlier, much of the real world discussion on stock market valuations concentrate on firms P/E ratio or its reciprocal the Earnings Price rate. It is not only a key variable in many value strategies but also one of the fundamental yardsticks (valuation tools) applied by investors in evaluation of the level of market prices in general and price of individual stocks in particular. Its simplicity makes it an attractive choice in applications ranging from pricing initial public offerings to making judgments on relative value. So in this part of analysis an attempt is made to determine empirically the relationship between the investment performance of equity shares of Information Technology sector in India and their P/E ratios.

6.4.1: Price Earnings ratio (P/E ratio)

The PE ratio is consistently defined, with the numerator being the value of equity per share and the denominator measuring earnings per share (EPS), which is a measure of equity earnings. The EPS value is often a full years worth of earnings. When the last four quarters are used to make the P/E as current as possible, the calculation is called trailing P/E. When the estimate of earnings for the coming year is used, the calculation is referred to as the forward P/E. Trailing P/E ratio is more accurate than the forward P/E as it is based on the actual earnings per share of a firm (Michael C Thomsett 2010).

There are two important ways to interpret P/E. The popular wisdom is that it is reflection of the market expectations of future earnings. If this were true, then it would follow that higher P/E stocks are better long term investments and this approach is followed by the investors of growth stocks.

The second way of looking at P/E contradicts this idea and the investors of value stocks prefer to use it for their investment game. According to this approach, a P/E that's exceptionally high may be interpreted to mean that the stock is overpriced compared with the other companies in the same industry. The second interpretation makes much more sense and used in this study.

P/E ratio gives the investor a fair idea of how a company's share price compares to its earnings. If the price of the share is too much lower than the earnings of the company, the stock is undervalued and it has the potential to rise in the near future. This is because investors become excessively pessimistic after a series of bad earnings or other bad news. Once future earnings turn out to be better than the unreasonably gloomy forecasts, the price adjusts. On the other hand, if the price is way too much higher than the actual earnings of the company and then the stock is said to be overvalued and the price can be fall at any point.

P/E ratio as a share valuation model has a number of attractive attributes. First it provides the convenient standard for comparing the prices of shares of stock which have different levels of EPS, since P/E ratio indicates the price per rupee of earnings. Second for stocks which do not currently pay dividend, a P/E ratio model may be applied for its valuation (P/E ratio models are difficult to use in analyzing companies which report negative earnings, but an Earning price rate can overcome this limitation). Third estimates used as inputs in P/E ratio models are easier to make than other valuation model.

6.4.2: Normal or Expected P/E ratio

The determination of the current P/E on a stock must be followed by a standard of comparison or an appropriate benchmark. This bench mark rate is usually termed as Normal P/E ratio. With this benchmark the security analyst compares the actual P/E ratio of each firm that he has considered for the purpose of his investment. There are at least three possibilities for the appropriate benchmark. First, a company's current P/E ratio could be compared to the temporal benchmark; that is, the average P/E ratio of the company over the previous several years. Here he may take mean or median P/E for a stock, its range overtime. Second a company's current P/E ratio could be compared to a cross sectional benchmark, that is the average P/E ratio of comparable companies (usually companies in the same industry). Finally, a company's a current P/E ratio could be compared to a theoretical benchmark; that is, the P/E ratio the company should have given some of its fundamentals. Usually a theoretical benchmark of P/E ratio (hereafter we call expected P/E ratio) is estimated by performing regressions of actual P/Es against the relevant fundamental variables which the analyst believes to be the main influences of the price movement of a stock.

6.4.3: Expected P/E ratios: - Cross Sectional Regression estimation

All other approaches other than theoretical approaches to determine the benchmark P/E are highly individualistic and eclectic, and therefore somewhat stable. In an attempt to bring some scientific evidence to the problem of 'normality' in P/E's, several studies have been conducted, using statistical techniques to achieve solutions. One method of constructing a model which will give explicit quantitative estimates of P/E ratios is to

assume that P/Es are linear and additive functions of some financial variables. Given this assumption, the most prominent statistical tool - regression technique can be used to estimate the 'average' relationship at one point in time between P/Es and selected company financials. The main aim of this technique is to determine the nature and extent to which the variables chosen explain stock price.

One of the first studies to employ regression methodology for estimating P/E ratio was performed by Whitbeck and Kisor in 1963. In their study they found that the differences in PE ratios between stocks could be explained by projected earnings growth, expected dividend payout and growth risk. Bower and Bower (1969) used a similar approach and found almost same effects of earnings growth and payout on P/E ratio. Malkiel and Cragg (1970) studied the effects of historical growth of earnings, dividend payout ratio and the stock's rate of return relative to the market in determining PE. Bernard and Thomas (1990) and Clare and Thomas (1995) were also used similar methodology to estimate the P/E ratio for a given set of fundamentals.

Even though there are disagreements among the researchers in equity research as to the relation between many of the company fundamentals and P/E ratios, most of their studies have brought in to consensus with regard to the existence of causal relationship between expected growth rate and P/E ratios of companies in various countries. Moreover the general approach utilized in factor analysis in the earlier section of this study found the co movement of P/E ratio and the growth rate of earnings only. This finding revalidate the conception generally pursued by the security analysts in their

investment management is that the rate at which the current earnings of a stock is capitalized is the outcome of psychological as well as economic factors, the forecast rate of growth in reported Earnings Per Share is likely the single most determinant of the price the investors are willing to pay. Since the causality between P/E ratio and other financial variables has not been captured by the factor analysis it is reasonable to assume that P/E ratio of firms is the sole function of its expected growth rate of earnings. Hence in this study we developed a simple regression model by regressing the PE ratios of selected 32 firms belongs to IT industry in India against their expected earnings growth rates. This type of analysis may indicate the relative level of P/E ratio of selected firms (compared with the P/E for a normalized level), but does not indicate the specific level of P/E that is appropriate for a certain stock.

6.5: P/E ratio (E/P rate) and its causal relation with Expected earnings growth – Simple Regression Model

For explaining the causal nature of relationship between the PE and expected earnings growth of a firm, we first fit a single factor regression model. The model is presented as follows:

$$Y_i = \alpha + \beta_i x_i + u_i$$

α and u_i are constant and error term(which assumed to be zero) respectively

Y_i =Expected P/E ratio

X_1 = Expected earnings growth

β_i = Impact of expected earnings growth on P/E ratio

6.5.1: Expected growth rate of earnings

The expected growth rate in earnings (EPS) is an important factor in equity valuation. If a relatively stable cost and profit structure is expected in the foreseeable future, the growth rate in earnings may be equated with the projected growth rate in sales. But as far as a growing service industry is concerned this will never happen. This is because of the intensity of competition; increasing operating cost especially the employee cost and presence of heavy research and development expenditure in its cost structure. So it is rational to assume expected growth rate of earnings in future as the function of the past earnings growth.

There are different approaches followed by security analysts in ascertaining past earnings growth of firms. Sometimes they take arithmetic mean of growth rate of earnings of the firms for the past few years and some other cases geometric mean instead of arithmetic average. For many investment problems which deal with rates of return, security analysts are interested in the geometric mean as opposed to the arithmetic mean. This is because arithmetic mean is always greater than the geometric mean. But in those cases when the individual growth rates are constant the arithmetic mean and geometric mean will be the same (McEnally 1986). Since the regression model that the study is used, based on the constant average annual growth of earnings during a particular period of analysis and also for the simplification, arithmetic mean of last 5 years (including the year of estimation) earnings growth rate is taken as expected growth of earnings in every 5th year.

6.5.2: Expected earnings growths and P/E ratios – Regression analysis

The regression methodology is a convenient way of compressing large amounts of data into one equation capturing the relationship between PE ratios and financial fundamentals. Table 6.4 displays the results of a simple linear regression that included earnings growth as independent variable. The study used the Earnings/Price ratio, rather than Price/Earnings ratio as dependent variable because the Litzenberger and Rao model posits linearity in E/P (not in P/E). More over during the days of negative earnings by companies the measurement of Price Earnings ratio in real mathematical terms are not possible. The expected sign of the relationship between earnings growth and E/P is same (positive) as we found in the factor analysis.

Table 6.4

Earnings Price rate and Expected growth of earnings: Regression results

Base year	Constant	Beta coefficients - Growth	Standardized coefficients	Adjusted R^2	F statistic
2004-05	0.071	0.001[3.976]	0.615	0.354	*15.806(0.000)
2005-06	0.052	.000 [2.616]	0.456	0.208	**6.842(.014)
2006-07	0.049	.000 [3.76]	0.593	0.352	*14.135(.001)
2007-08	79.24	143.55[1.19]	0.219	0.048	1.416 (.244)
2008-09	-1.219	.023 [4.151]	0.631	0.399	*17.228(.000)
2009-10	-0.335	.007 [6.196]	0.766	0.587	*38.39 (.000)

Figures given in [ ] indicates the values of t statistic; Figures given in ( ) sig value of F statistic

*Significant at one per cent level   **Significant at five percent level

The analysis of regression results reported in Table 6.4 summarizes the explanatory power of expected growth rate of earnings in determining the variations in Earnings Price rate. The value of R^2 (ie proportion of variance explained) adjusted for degrees of freedom ranges from 5 per cent to 59 per cent. In many of the years more than one third of the per cent variations in E/P rate could be explained by the expected growth of earnings of the firm. The F statistic, which tests the null hypothesis that all the coefficient are zero (expected earnings growth shall not able to explain the earning price relationship of a particular year) is found significant at one per cent level in five out of the six years considered for the study. Only in 2007-08 the study has found the insignificance of expected earnings growth in explaining the earnings price rate (E/P) of that year. This could be linked to the common notion of stock market investment that during abnormal market growth conditions, there will be the general tendency of the stocks in the market to move up regardless of its earning fundamentals. In all other years the regression coefficient of expected growth of earnings on E/P rate is found significant at one per cent level of significance. From these results it is rational to infer that earnings growth rate of a company is one of the significant variable in determining the movement of its stock prices in the market.

6.5.3: Comparison between Actual and Normal Earnings Price ratios

The security analysts who believe in the usefulness of value strategies in investment management often denies the efficient market hypothesis, which proposes the impossibility of earning excess returns in a market which is efficient in terms of investment information. The value strategists also asserts that P/E ratios, due to exaggerated investor expectations may be indicator of future investment performance and the use of which definitely helps investors in assessing true worth of a stock and provides opportunity for them to take advantage of market disequilibria by acquiring low P/E (high E/P) stocks.

Once the analyst has determined the average relationship between the P/E ratio and expected earnings growth for all stocks, then he can estimate the P/E ratio (Normal P/E ratio) for the individual stock and compare the same with the actual P/E. If the actual P/E for a particular stock is greater than its estimated P/E, he might conclude that the stock is overpriced and if actual PE is smaller than the Normal PE, the stock is underpriced; it could be purchased with a reasonable expectation that its price will rise. If actual PE equals the Normal PE, the stock is correctly priced. **Since this study has used E/P ratio (reciprocal of P/E) the conclusions of the comparison shall be just opposite of these investment judgments.**

Table 6.5

Actual E/P rate and Expected E/P rate of stocks – A comparison

Year	2004-05		2005-06		2006-07		2008-09	
Company	Actual E/P	Normal E/P	Actual E/P	Normal E/P	Actual E/P	Normal E/P	Actual E/P	Normal E/P
Gtl	*0.15	0.06	*0.06	0.05	*0.04	0.04	*0.05	-0.6
Tatelxsi	*0.11	0.09	*0.06	0.06	*0.09	0.06	*0.12	-0.57
Bluestar	0.08	0.09	*0.05	0.05	*0.08	0.05	*0.28	-0.89
Zensar	0.08	0.11	*0.05	0.05	0.06	0.07	*0.33	-0.14
Sonata	*0.07	0.07	0.02	0.05	0.05	0.07	0.32	0.56
Polaris	0.05	0.08	0.01	0.05	0.04	0.08	0.25	0.95
HCL Tech.	0.03	0.08	0.04	0.05	0.05	0.06	*0.08	-0.47
Calsoft	*0.13	0.11	*0.13	0.07	*0.12	0.07	*-0.34	-0.4
CMC	0.02	0.09	0.05	0.06	0.03	0.06	*0.22	-0.56
VIL	0.05	0.36	0.07	0.12	0.19	0.20	0.16	0.17
Geometric	0.04	0.08	0.03	0.06	0.05	0.06	*0.48	-0.54
RS Soft	-0.07	0.01	*0.16	0.00	*0.12	0.01	*0.72	0.43
Sterlite	*0.03	-0.01	*0.07	0.04	*0.05	0.04	*0.19	-0.06
KLG	*0.42	0.10	*0.27	0.06	*0.30	0.09	*1.96	1.18
Kale	0.00	0.02	0.05	0.07	0.07	0.10	0.31	2.31
Onward	0.05	0.20	0.04	0.06	*0.01	-0.05	-0.79	-5.27
Aftek	*0.25	0.11	*0.10	0.06	*0.16	0.05	*-0.16	-1.46
Infotech	0.06	0.09	0.04	0.06	0.04	0.06	*0.15	-0.08
Infosys	0.03	0.11	0.03	0.06	0.03	0.06	*0.08	-0.38
Wipro	0.03	0.11	0.03	0.06	0.03	0.06	*0.08	-0.57
HCL Info.	0.00	0.08	0.04	0.06	*0.14	0.07	*0.20	-0.51
MRO	*0.06	0.06	*0.11	0.06	0.06	0.07	*0.09	-0.22
Smartlink	0.08	0.10	*0.07	0.05	*0.10	0.05	*0.06	-1.58
Zenith	*0.15	0.08	0.10	0.13	0.11	0.20	0.05	0.09
KPIT	*0.05	-0.08	0.05	0.07	0.05	0.09	*0.31	-0.28
Mastek	0.09	0.11	0.05	0.07	*0.12	0.08	0.30	0.56
Ramco	-0.10	-0.08	-0.11	0.01	-0.16	0.03	-0.02	-0.93
Softpro	0.05	0.11	0.04	0.06	*0.19	0.11	0.05	1.08
Rolta	*0.20	0.08	*0.12	0.06	0.05	0.06	*0.18	-0.40
Computesh	*0.30	0.13	*0.16	0.07	*0.18	0.09	-15.00	-5.72
Cybertech	*-0.03	-0.03	*0.18	0.06	*0.14	0.12	0.31	3.57
Goldstone	0.06	0.07	*0.04	0.04	0.09	0.13	0.04	1.49
No. of stocks undervalued	13 (40.62)		15(46.88)		15(46.88)		20(62.5)	
No. of stocks overvalued	19 (59.38)		17(53.12)		17(53.12)		12(37.5)	

*indicates undervalued stocks

Figure given in brackets indicates per cent of undervalued and overvalued stocks

Investors believe in value strategies ultimately wish to park their funds in undervalued/fairly valued stocks, this is because of their notion that the overpriced stocks have their prices and PE driven down to appropriate levels by selling pressure which in turn cause loss to their wealth. So for the purpose of the study we classify the stocks as undervalued (including fairly valued) and overvalued ones only based on the comparison between actual E/P and expected E/P of each of the stock included in the sample. The results of comparison and its discussion as to the undervaluation or overvaluation of stocks are reported in Table 6.5.

Analysis shows that thirteen stocks were undervalued in 2004-05, fifteen stocks in 2005-06, another fifteen stocks in 2006-07 and twenty stocks in 2008-09. Certain mid cap stocks like GTL, Tata Elxsi, California Softwares, Sterlite Tecnologies and KLG systel found undervalued by the market in all the four periods of analysis. It is worth to note that most of the large cap stocks (Infosys CMC, Wipro and HCl Technologies) were overvalued by the market in all years of observation. Similarly some small cap stocks (Computech and Cybertech) were undervalued by the market in all years except 2008-09, the crisis year for the Indian economy as well as Indian stock market. An overvaluation of small stocks during the times of financial crisis could be attributed to the play of traders/speculators who normally wish to trade in small stocks for capitalizing the opportunities created by the market disorders.

Table 6.6

Return profile of Undervalued and Overvalued stocks

Company	2005-06	Rank	2006-07	Rank	2007-08	Rank	2009-10	Rank
Gtl	*69.47	7	*-5.68	21	*88.31	4	*72.14	27
Tat elx	*8.65	20	*53.80	10	*-43.12	24	*297.75	7
Bluestar Tech	-17.26	27	*-7.97	22	*-34.89	20	*150.58	16
Zensar	5.44	22	*17.51	14	-52.88	30	*259.04	11
Sonata	*62.27	9	83.72	8	-46.37	26	266.88	10
Polaris	9.79	19	56.15	9	-55.65	31	271.59	9
Hcl tech	33.67	13	-30.26	26	-23.96	16	*94.89	24
Calsoft	*138.58	2	*-40.42	30	*68.16	5	*227.37	13
Cmc	-13.73	25	129.55	4	-32.56	18	*325.16	6
Visesh	123.95	4	-45.28	32	-38.64	22	85.25	25
Geometric	21.69	16	0.10	19	-47.16	28	*346.05	4
rs soft	81.54	6	*-30.63	27	*-59.20	32	*242.36	12
Sterlite	*58.27	11	*88.11	7	*-9.97	8	*528.83	1
Klg	*61.01	10	*471.27	1	*199.27	3	*111.80	20
Kale	23.99	15	-1.22	20	-51.88	29	272.67	8
Onward	-47.25	31	-40.12	29	-22.60	14	118.06	19
Aftek	*0.96	24	-14.12	24	-33.61	19	*123.49	18
Infotech	90.78	5	106.37	5	-22.36	13	*336.29	5
Infosys	34.08	12	35.80	12	-27.02	17	*99.48	23
Wipro	67.58	8	1.02	17	-21.68	11	*189.93	14
Hcl infos	-16.42	26	51.24	11	*-21.69	12	*4.80	31
Mro	*136.47	3	*5.92	16	-18.62	10	*74.28	26
Smartly	-29.53	29	*0.29	18	*-38.01	21	*-45.70	32
Zenith	*374.38	1	-41.09	31	-44.71	25	71.99	28
KPIT	*30.93	14	-16.39	25	-39.69	23	*354.30	3
Mastek	2.32	23	-12.68	23	*10.33	6	187.20	15
Remco	-53.60	32	-37.45	28	0.12	7	109.21	21
Softpro	12.98	18	9.54	15	*230.86	1	383.49	2
Rolta	*20.63	17	*219.01	3	-46.72	27	*35.82	29
Computech	*33.33	30	*26.72	13	*-23.81	15	16.07	30
Cybertech	*8.50	21	*99.54	6	*-17.43	9	132.54	17
Goldstone	-28.84	28	*293.49	2	204.29	2	101.46	22

*indicates rate of return produced by undervalued stocks

6.5.4: Return profile of undervalued and overvalued stocks – A comparison

Is the security valuation strategy based on Earnings Price rate of fundamentalists really helping the investors to produce better returns in the subsequent year of market valuation of stocks? For answering this question we took an assumption that an investor should purchase the sample stocks on the first day of the accounting period subsequent to the year in which valuation made and has to hold it till last trading day of that period. By taking the difference in the market values of the stocks on these two dates plus any dividend declared and paid during the period we compute the return that he will have made from it. Such comparison has been made for four periods – 2005-06, 2006-07, 2007-08 and 2009-10.

Analysis of Table 6.6 reveals that in 2005-06 the return profile of undervalued stocks was really amazing compared to its counter group of overvalued stocks. Among the top twenty stocks in terms of producing return during the year, ten stocks were identified as undervalued in its just preceding year, 2004-05. Out of these ten stocks, three were ranked as the top three well performing stocks by delivering returns at an outstanding scale of 136.47 per cent to 374.38 per cent. Six undervalued stocks were included the best ten stocks (in the sample) of the year. It is also very interesting to note that when the performance of seven out of nineteen overvalued stocks were made negative returns to their investors, only three of the thirteen undervalued stocks performance was negative.

Looking across the column of 2006-07 in Table 6.6 we can observe a pattern of positive return for undervalued stocks and negative returns for overvalued stocks. Moreover what trend and pattern we have perceived in the performance of undervalued stocks in 2005-06, the same has been

continued in 2006-07 also. Out of the eighteen stocks which have generated positive returns during that year ten were belonged to the undervalued group. The stocks which delivered amazing returns to their investors (here we mean more than 200 per cent) come only from the stocks which had been assessed as undervalued in 2005-06.

In 2007-08 there were only six stocks included in the sample generated a positive return to their investors, out of which only one from overvalued group and the rest five all come from undervalued group of shares. Such a pattern in return profile of stocks indicates that even during the bad market conditions, the undervalued stocks can protect the investors interest a little, though that attribute is   not much common to all stocks in the group.

All the stocks (except smart link) included in the sample were able to deliver relatively good returns to their investors in 2009-10. To an extent we can attribute this fact to the gradual revival of investor confidence after the shock that global economic recession exerted on Indian financial system and also to the reinstatement of the stable political system of the country. Both of these factors restore confidence in the mind of the investors and they rush to purchase the stocks which in turn made a surge in their market value. But when we closely look in to the pattern of their growth in value during this period we can see that the growth rate was remarkably high in case of most of the stocks which were undervalued by the same market in 2008-09. Of the five stocks which occupied foremost positions in terms of growth in value among the group, four were from the undervalued group. When six of the undervalued stocks were able to produce a return at a rate which is three hundred per cent or more, only one of the overvalued stocks was able to

generate return to its investors at that scale. When we make a close analysis of the results it can also see that the stock investments in small sized firms earned significantly higher rates of return than the similar investments in large sized companies. This finding is in conformity with the findings of Banz (1981).

Table 6.7 displays the average returns on annual basis produced by undervalued stocks and overvalued stocks for its investors during the four assessment periods along with the return produced by the broad based Index NSE Nifty (market return).

Table 6.7

Mean annual returns of Undervalued and Overvalued stocks

Year	Market return	Mean return of Under - valued stocks	Mean return of Over- valued stocks	t statistic	Sig.Value (p)
2005-06	67.38	72.06	15.85	2.073*	0.047
2006-07	11.99	85.07	13.04	1.985*	.0500
2007-08	31.59	28.37	-22.19	1.909**	.066
2009-10	71.53	191.43	168.03	0.484	.632

*Significant at five per cent level   **Significant at 10 per cent level

From the analysis it is understood that in all periods of observation (except in 2007-8) undervalued stocks received return (on average) at a rate which is much higher than the rate of return given by the market index. But overvalued stocks were able to beat the market in terms of return only in 2009-10. In all other years of observation the performance of overvalued stocks was poorer than the overall market performance. When the difference in mean returns of undervalued and overvalued stocks were tested with the help of parametric tool (t-test), the difference found statistically significant at five per cent level (in 2005-06 and 2006-07) and at ten per cent level (in

2007-08). In 2009-10 the analysis has not observed the statistical significance of difference in the performance of two group stocks at any level. The continuity of the superior performance of undervalued stocks relative to the market as well as overvalued stocks reinforce the validity of the argument of the investment strategists in the use of Price Earnings ratio as the tool for earning excess returns from stock market investments.

6.6: Multi Dimensional Scale Diagram (MDS Diagram)

Based on the four selected investment performance indicators – Average return, Beta, Price to Book ratio and Earnings Price (E/P) rate – four distinct groups have formed from the 32 stocks selected for the study by using an MDS diagram. The purpose of this grouping is to identify whether there exists any possibility for investors in Indian stock market to enjoy the same level of investment benefits from the small and medium cap segment that they would have enjoyed from the large cap segment of the market.
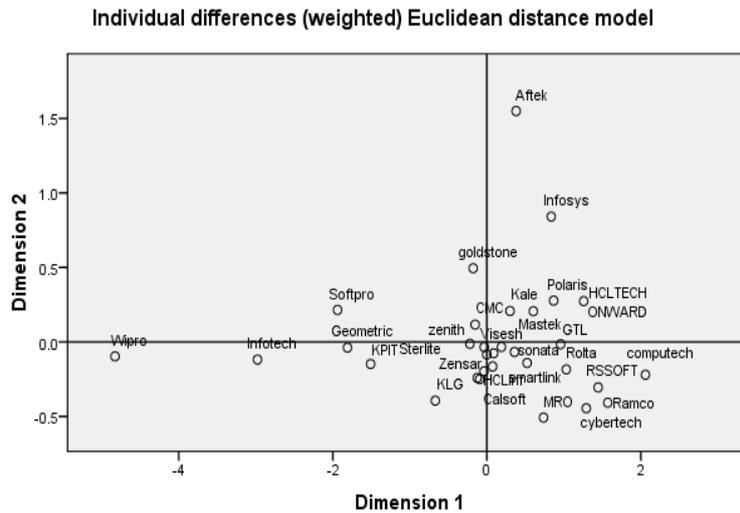
Figure: 6.1

Matching Investments with different segment stocks – MDS Diagram

From the diagram it is quite obvious that the investment in some stocks from small/medium segment stocks would enable the investors to enjoy the benefits at par with the benefits delivered by the stocks of some frontline companies in India. Investment in companies from small cap segments – Aftek and Kale could produce the same rate of return that delivered by the large cap stocks- Infosys and HCL Technologies and which is at the same risk level. The risk return profile and the value positions (in relative terms) of Polaris, Mastek, CMC and GTL are much similar to that of these two large cap stocks. Similarly the investment profile of Infotech, KPIT, Sterlite, KLG and Geometric are almost at parity with WIPRO. All these facts make an impression that with lower amount of funds one can find good investment opportunity in small/medium segment of Indian stock market which otherwise he would have enjoyed by parking larger volume of funds in highly priced stocks.

Thus from above discussions, it is right to conclude that value strategies outperform growth strategies in managing stock market investments in India. Undervalued stocks can produce better returns than overvalued stocks and their success has been both persistent and impressive. In each of the four years following the year in which evaluation of stocks were made the undervalued group had a mean return performance superior to that of the stocks labeled overvalued in terms of its expected Earnings Price rate. So the Earnings Price rate or Price Earnings rate is a valuable analytic device when properly interpreted. It is of primary importance in assisting investors in evaluating stock purchases and particularly helpful in the difficult analysis of the growth situations. The publicly available Earnings Price rate seems to possess information content and warrant an investor's attention at the time of portfolio formation or revision. According

to the analysis which has made with this tool in the study the best buy would be the stock whose reported earnings per share is expected to grow most rapidly. Investment in fundamentally strong companies having low Price Earnings rate /high Earnings Price rate definitely deliver better return than those provided by other strategies on a long term perspective. But one should be more systematic in conceiving the growth rate of earnings the failure of which results in negative outcomes. All other company financials seem to be of not much significance in explaining the variations in stock returns in India.

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SUMMARY OF FINDINGS AND CONCLUSIONS

Contents

7.1: Findings of the study

7.2: Suggestions

7.3: Scope for further research

7.4: Conclusions

The valuation of common stock/equity share is much more difficult than that of other securities like bonds, debentures etc. The variability in its future stream of returns and the uncertainty about the future values/prices of stocks caused by such variations in returns makes the valuation of these securities become more complex. Hence identifying the forces that drive stock prices is a major concern for equity investors in stock markets. Similarly identification of factors in explaining the prices of stocks traded in market is also important for academics too. This is because by using the substantive knowledge acquired by them from their research, they can suggest suitable policy framework to the regulatory and development authorities for their timely influence on the stock market of a country for attaining its balanced economic growth. More over output generated by their research definitely helps the investors to devise active investment strategies in accordance with the investment objectives and resource constraints.

Stock prices in a market may be determined by a host of factors ranging from rational and fundamental factors to irrational psychosomatic factors. So the behavior of stock prices is studied with the help of different

methods or approaches. These approaches can be grouped in to two diametrically opposed approaches as Fundamental and Technical analysis.

On surveying the existing literature available on the equity research it is identified that studies verifying the determinants of stock returns have already been made in Indian context, though not extensive. But the divergence in findings of these studies often confuses the millions of investors in the country – which approach they should follow and what factors they have to consider as the base for the valuation of their stock investments. Again most of these studies give thrust only to identify the prominent factors which determine the stock returns in India during a particular period. In fact they have not made any attempt to examine the ability of these factors to forecast the share prices/returns in subsequent periods; thereby failed to give sensible and concrete solutions to problems persisting in the valuation of stocks in the Indian capital market. Studies leading to the decision as to how the performance of a particular sector or firms in the group specifically affects the returns of that sectoral stock and the nature of relationship between the factors determining its performance and stock returns are rare among the research works of this kind. The present study titled 'Fundamental approach to valuation of securities – A study with reference to Information Technology (IT) sector shares in Indian Stock Market" is expected to fill the existing gap in the equity research base in India.

7.1: Findings of the study

The ongoing paragraphs shall discuss the findings those revealed by the analysis made under different dimensions of the study.

7.1.1: Formulation of base hypothesis

The base hypothesis of the study - "*Fundamental approach to valuation of shares can produce superior returns to long term equity investors in India.*" was formulated on the basis of a sample study covering stocks of 52 companies which completed ten years of listing in NSE and included in Nifty or Nifty Junior Index.

At first a simple test of random walk is conducted by examining the annual growth in stock prices. The expected frequencies of the sample distribution were estimated by fitting a binomial distribution model and the actual results were compared with expected results. Then a run test has administered, where the actual runs were compared with the results one would expect if stock price changes were distributed in a random fashion (Poisson model). Both tests failed to prove the random behavior of stock prices in India in the long run. Irrelevance of random walk hypothesis in Indian context justifies the possibility of making abnormal returns by the investors of Indian stock market.

Auto Correlation Function technique employed in the study defied the "Theory of past price changes shall affect the further price movement in the stock market' in the Indian context. This is because; from the study it came to know that the change in previous year's stock prices one can explain only 25 per cent of the change in the current year stock prices and this was for the most extreme autocorrelation. Moreover the Ljung–Box Q-statistics accepted the joint null hypothesis of zero autocorrelations for the full period in almost all companies included in the sample. Thus we reached a hypothesis that fundamental approach to valuation of shares can produce better returns to long term equity investors in India and the forecasts of

future stock prices/ returns there should be based on a large variety of economic variables- among these there would be economic environment the firm is expected to operate in, the profile of the industry it belongs to and its expected competitive position, operating efficiency, dividend policy after all quality of management.

7.1.2: Macro economic performance and stock returns in India

- Indian economy showed robust growth during the last ten years of the study. High growth rates in industry and service sectors and a benign world economic environment provided a backdrop conducive to the Indian economy. The economy has expanded on an average 8.5 per cent between 2003-04 and 2009-10. During the first seven years of the study period Wholesale Price Inflation (WPI) in India was within the tolerance band of 5-7 per cent. Thereafter it remained always at elevated level. Interest rate was on upward trend during the period 2003-04 to 2007-08. The repo rate was increased from 6 per cent to 7.75 per cent during this period. But monetary management during 2008-09 (reduction of repo rate to 5 per cent) had to contend with challenges of high inflation in the first half and the high speed and magnitude of the external shocks and its spillover effect through the real, financial and confidence channels in the second half. On the external sector front, although India's current account deficit has been widening, its robust macroeconomic fundamentals have also facilitated some capital inflows in to the country. But during the periods of heightened global uncertainty (2008-09), panic were seen among the Foreign Institutional investors, on account of which huge amount of capital was out flowed from the country. The reduction in

capital flows caused dip below Rs 50 to the dollar, even as RBI's foreign exchange reserves have fallen by $57.70 billion during that year.

- Indian stock market, in terms of return has performed very well during the post reform period. In most of the years it was able to produce positive returns to its investors. Every alternate year from 2003-04, the market has delivered terrific returns and its return profile during those years is abnormally higher than that of just previous years. Highest market growth (85.11 per cent) was observed in 2003-04 which could be attributed to the overall IT boom in the world economy. Since then, the stock market of the country was able to produce return for investors and the same trend continued until 2008-09. But the year 2008-09 brought in relentless distress to the investors by causing a loss of more than one-third of the value of their wealth which they would have hold at the beginning of the year. But the financial year 2009-10 again saw the market delivering amazing returns (71.51 per cent) which enable the investors to earn twice of their capital which they lost in the previous year (on considering it in relative terms).

- The return volatility of the stocks in India has been increasing year by year especially from 2004-05 onwards. In 2008-09, when market tumbled down by the Global financial tsunami, market volatility reached its extreme high of 12.84 per cent. The persisting trend in stock market volatility of the country confirms the observation of market critics that India is one of the riskiest emerging markets of this world. It is also found that frequency distribution of monthly stock returns in India were not normal during most part of the study period.

In fact during mid years of the study (2004-05 to 2006-07) it showed extreme form of skewness as its coefficients were excess of unity. Of the 10 year study period, during 6 years the distribution of stock returns in India exhibited medium to high degree of negative asymmetry indicating the greater possibility of large decreases in prices there rather than rises, which could be a real concern to investors.

- Unit root results found the variables IIP and FII net flows stationary at the level itself, hence we can say that they were integrated at order 0, ie. I (0) variable. But the remaining five variables (exchange rate, TBR, WPI, M3 and Nifty were integrated of order 1, ie. I (1) as they become stationary with intercept and trend at one per cent level of significance after their first differencing.

- F values of lagged terms up to three lags in the VAR system rejected the null hypothesis that macro economic variables do not jointly cause NSE Nifty at one per cent level of significance. The signs of all variables were in line with the theoretical predictions. VAR results showed that the relationship between NSE Nifty and macro economic variables is statistically significant in the case of four variables – interest rate, exchange rate, money supply (all these at 5 per cent level) and FII inflows which are at 10 per cent level.

- Bi-directional causality has been observed between NSE Nifty and interest rate in India. Interest rate has showed inverse relationship with the stock price movement. Softening of interest rate in India by RBI made favorable impact on Indian stock market for two reasons. Lower interest rate in the fixed income segment has made the investors

fonder of equity investments which have provided a boost to the stock market. It has helped corporate a lot to mobilize capital from domestic as well as international market easily, which in turn makes the debt market redundant one and such lack of demand for debt fund made it cheaper. These could be the reasons for two way causality between interest rate and stock returns in India.

- There was direct casual link between money supply and NSE Nifty. An increase in the money supply leads to economic expansion through increased cash inflows and the stock prices is benefitted from the economic growth lead by such expansionary monetary policy. Money supply was also affecting the stock index movement through its effect on interest rate also. It also revealed that exchange rate causes Nifty, while there was no causality from Nifty to exchange rate. Currency depreciation leads to more export earnings and higher capital inflows to the country thereby increased foreign exchange. More supply of foreign currency increases the money supply and expanding stock market.

- There was only unidirectional causality from FII inflows to NSE Nifty. This could be the outcome of positive effect of FII inflows on expectations regarding the growth prospects of the stock market in the country. In case of NSE Nifty to Index of Industrial Production there was no causality in either direction. Similarly inflationary conditions in the country did not cause stock index at any level, however it might have affected the stock price movement through its upshot on interest rate, thereby money supply in the market. The VAR results also indicated that all the three monetary variables – money supply, inflation rate and interest rate are highly integrated as there

bidirectional causality existed among them. More over linkage was also visible between financial sector and real sector variables. When money supply has its effect on FII inflows to India, the FII inflow leads Industrial production of the country which in turn has direct impact on exchange rate. Such effects on exchange rate causes money supply there by inflation also. From the linkages between the monetary variables and again its causality with the financial sector variables it can deduce that money supply is the prime economic variable which could make significant impact on stock return volatility in India. All these findings lead to a valid conclusion that any variable which has a negative effect on cash flows shall be in inverse relationship with the stock prices.

7.1.3: Industry performance and Stock returns in India

- There has been sector wise difference existed in the performance of industries in India in terms of various financial measures. The rate of growth in income of all selected sectors showed volatility during the study period. But there existed difference among them in terms of the lag in their sensitivity to swings in the economy. With regard to the profitability, the performance of FMCG was far ahead of other sectors. Initially sectors like Information Technology and Automobiles gained increase in their profit at a rate much higher than the rate of growth in its investments during the first four to five years, but later they could not keep up that trend. The economic efficiency of the business of other two sectors– Pharmaceuticals and Energy, according to ROI measure found less volatile or almost consistent throughout the period.

- Among the group of five sectors only Information Technology is found more labor intensive and more than 40 per cent of its total cost comprises of employees cost. Hence its capital intensity is at a very low degree (less than 20 per cent) in most of the years. On account of lower capital intensity this industry may suffer far less from the depreciation shortfall. However the trend in the rate of increase in its employee cost compared to the rate of increase in its total cost is against the stand point of the rational investment that the best industry is one in which the labor cost represents a small portion of the cost of operations. All other sectors in the group are heavily invested in expensive, long lived plant and equipment which would have enabled them to enjoy more operating leverage during good days of the economy.

- Information Technology and Pharmaceutical sectors were more exposed to the foreign markets than the other sectors in the sample. Exports constitute the major chunk of the sales of the companies from IT sector in India. More than 80 per cent of their sales have been procured by this sector from its foreign market. Similarly around one third of the sales of the Indian Pharmaceutical industry constitutes by exports. All other sectors considered for the study highly domestic market oriented and their global market penetration was marginal only. The liquidity conditions prevailing in different sectors in India were neither uniform across sectors nor consistent across the time horizon. Information Technology industry was the only one sector which has maintained a reasonably good level of liquidity as its current ratio was almost equal to 2. The liquidity

conditions of Pharmaceuticals were somewhat better than the remaining three sectors.

- The return generating capacity of different sector stocks in India were not uniform during the study period. It also found that the stock returns in India were not commensurate with the risk profile of investments. Energy sector scrip delivered a highest return among the group. In risk terms FMCG sector indices outperformed other sector indices. Pharmaceutical stocks also showed more consistency compared to the stocks of remaining sectors.

- Investment in IT sector stocks in India has not been better rewarded to the level of the risk that its investors actually assumed. Information Technology sector stocks proved to be the most risky investments for investors, but in terms of return it is only in fourth position. Again the frequency distribution of all the indices except Energy and Automobiles found not normal, but none of the sectors showed any extreme level of skewness. When IT and Pharmaceutical indices showed moderate degree of negative skewness indicating the greater probability of large decreases in prices rather than rises, FMCG sector showed low degree of positive asymmetry in distribution of returns.

- The results of the stepwise regression (MaxR method) technique administered in the study found the divergence in the performance of industries as a significant factor determining stock returns in India. However among the seven factors selected for determining its impact on industrial stock returns in India, only three factors - capital intensity, liquidity conditions and share of exports were realized as

the strongest factors among the group. The relationship of stock returns with these three factors is exactly in accordance with the theoretical expectations. When the relationship of the stock returns with the capital intensity and export performance (measured through share of export sales) found positive and significant at one per cent level, its causal relationship between the liquidity conditions of different sectors found negative and significant at the same level. The value of adjusted R^2 indicates that about 80 per cent of the variations in industrial stock returns during the study period were altogether contributed by these three industry factors.

7.1.4: Structure and Competitiveness of Indian IT industry and impact on its profitability

- When the model developed by Michael Porter (1985) used for analyzing the competitive conditions prevailing in IT industry and its relation with the industry's profitability it found that the existence of competitive forces at aggravate level in the industry has been considerably affected the performance of its member firms and most often they forced to operate at a lower margin. Supportive policies of the Government, lower capital investment requirements, availability of cheap and skilled professionals in the country facilitated free entry and easy exist by the firms from the IT industry. Stiff competition, rapid technological changes and high rate of piracy demand frequent product introductions and enhancements which in turn pressure the firms in the industry to invest heavily in the Research and Development which squeeze their profit margins considerably. Corporate buyers, who account for a substantial portion of the

market, are highly price sensitive and enjoy bargaining power. Since major inputs of the product supplied by Information Technology firms constitute Processors, Operating Systems and Personnel (IT programmer or Professional) the bargaining power of suppliers in the IT industry is very high. Even though there has been no substitutes for almost all of the products or services offered by the IT industry, the prevalence of other forces at aggravate level constrains the ability of firms in the industry to raise prices. Moreover high degree of exposure to the external markets, the economic crisis in the developed world and currency fluctuations are expected to have negative impact on the revenue growth of Information Technology Industry of India in the near future.

7.1.5: Corporate performance and stock returns

- The products/services portfolio of the IT companies in India mainly consisted of services which include business and technology consulting, application services, systems integration, product engineering, custom software development, maintenance and re-engineering services in the IT space. Many of these firms have been focused on global markets especially USA and Europe and has already been started their Strategic Business Centers there for expanding their business. Most of the selected firms (except HCL Technologies, GTL and Wipro) exclusively operate in services segment of the sector. HCL Infosystems Ltd. is India's premier computer hardware company and GTL is one of the leading Network Services company, offering services and solutions to deal with the Network Life Cycle requirements of Telecom Carriers and

Technology providers. Wipro operates in both hardware and software segments. HCL Technologies, Wipro and Infosys have been maintaining their own BPO divisions also.

- Earnings positions of majority of the companies in the group fluctuated heavily with the domestic as well as global downturns and currency volatility. However a few number of companies like Infosys, Wipro, HCL Technologies, KPIT, Infotech, Sonata, Tata Elxsi and Zensar attained significant growth in their earnings regardless of the changes in the economic cycles. Their profitability measured in terms of the return on capital employed by them has gone down in the case of most of the firms including the leading players in the industry. HCL Infosystem, KPIT, Sterlite, CMC, Sonata, Zensar etc…were some of the companies' exceptions to this.

- The credit standing of most of the companies under study (except, Zenith computers, Onward Technologies, Sterlite Technologies, GTL and Computech) found strong as they have lower ratio of debt content in their capital structure. Some of these companies like Infosys, Polaris, Sonata, Bluestar, Zensar and Cybertech have been running debt-free operations for more than a decade. Owing to this shareholders might have barred from the benefits of trading on equity, but their operational flexibility have not yet jeopardized. The emerging liquidity position of almost all companies appeared highly satisfactory and they might not have encountered any difficulty in servicing the claims of their short term creditors.

- Investment valuation ratios of majority of the companies in the group showed upward trend during the period of the study. The book

value of almost all companies increased and most of them have been paying dividend consistently over the years regardless of the fluctuations in EPS. Some of these companies have already issued bonus shares and holds promise of issuing more in future in terms of its widening reserve base. Though the earnings of most of the firms in the Indian IT industry were badly affected by the last Global Financial crisis, on considering their performance in remaining years it is reasonable to expect that the recovery in the world economy and growth in overall IT spends, shall record well growth in their revenues in the years to come.

- The shares of the companies like Infosys, Wipro, Polaris, Rolta, CMC, Infotech Enterprises Sterlite Technologies, HCL Technologies, Mastek, GTL, etc. have performed well during the study period and received greater value in the market. Stocks like Rolta, Zenith, Aftek, KLG, GTL, Tata Elxsi, Bluestar etc. have produced more returns than those generated by the scrip of the frontline companies. Investment in Aftek, GTL, Kale, HCL Tech, etc. could produce the same rate of return that the Infosys delivered and that was almost at same risk level. Similarly risk return profile of Infotech, KPIT, Sterlite, KLG, Geometric and WIPRO were almost same.

- Exploratory factor analysis has been administered in the study to explore the dimensions that could have caused correlations among the observed company fundamental variables. The factor extraction method of Principal Component Analysis was opted to identify the critical factors. KMO and Bartlett's Test of sphericity confirmed the appropriateness of the factor model in the study.

- By following Kaiser's rule of retaining factors with Eigen values greater than unity, five factors have extracted from the data. These factors were labeled as the size and Growth factors (EPS, book value per share, market capitalization and price - book ratio), Profitability factors (return on capital employed and return on equity), Valuation factor (earnings yield (just reciprocal of Price Earnings ratio), earnings growth and average return), Risk and volatility factors (beta and debt- equity proportion in the capital structure) and finally Income Factor (solely constituted by Dividend yield) Even though the dividend factor is an indicator of residual income distribution policy of firms, the absence of the significant correlation of this factor with any of the other eleven financial variables under study pose some problems in judging its impact on the price movement of firms' common stocks in the market. Such a situation indirectly validated the argument of dividend irrelevance in valuation of firms in Indian stock market conditions.

- Factor analysis found positive relationship among the earnings growth, Price Earnings (P/E) ratio and Annual stock returns. So the variables – earnings growth and P/E ratio (or earnings price rate) could be used as an effective tool to track the price behavior of the Information Technology stocks in the Indian stock market. In other words P/E approach could be used as a value strategy in making valuation of shares in Indian stock market.

- Simple regression analysis found expected earnings growth (based on the average earnings growth of last 5 years) as a significant determinant of P/E ratio of stocks in all the years of the study period

except in 2007-08. During abnormal market conditions the stock prices in India guided by irrational factors more than by earning fundamentals.

- By comparing the actual P/E with the estimated P/E for the given expected earnings growth, stocks undervalued and overvalued by the market in different periods) were identified. There were thirteen stocks found undervalued in 2004-05, fifteen stocks were in 2005-06, another fifteen stocks were in 2006-07 and twenty stocks were in 2008-09. Since the model was not able to capture the statistically significant causal relationship between expected earnings growth and P/E rate, no valuation has been made for the year 2007-08.

- Certain mid cap stocks like GTL, Tata Elxsi, California Software Ltd, Sterlite and KLG found undervalued by the market in all the four periods of analysis. It is worth to note that most of the large cap stocks (Infosys CMC, Wipro and HCL Technologies were overvalued by the market in all years of observation. Similarly some small cap stocks (Computech and Cybertech) were undervalued by the market in all years except 2008-09. An overvaluation of small stocks during the times of financial crisis could be attributed to the play of traders/speculators who normally wish to trade in small stocks for capitalizing the opportunities emerged from the market disorders.

- In 2005-06 the return profile of undervalued stocks was outstanding compared to its counter group of overvalued stocks. Among the top twenty stocks in terms of producing return during the year, ten stocks were identified as undervalued in its just preceding year, 2004-05. Out of these ten stocks, three were ranked as the top well

performing stocks by delivering returns at an outstanding scale of 136.47 per cent to 374.38 per cent. Six undervalued stocks were included the best ten stocks (in the sample) of the year. When the performance of seven out of nineteen overvalued stocks were made negative returns to their investors, only three of the thirteen undervalued stocks performance was negative.

- In 2006-07 the study observed a pattern of positive return for undervalued stocks and negative returns for overvalued stocks. The trend and pattern perceived in the performance of undervalued stocks in 2005-06, the same has been continued in 2006-07 also. Out of the eighteen stocks which have generated positive returns during that year ten were belonged to the undervalued group. The stocks which delivered amazing returns to their investors were come only from the stocks which had been assessed as undervalued in 2005-06.

- In 2007-08 there were only six stocks included in the sample generated positive returns to their investors, out of which only one from overvalued group and the rest five all come from undervalued group of shares. Such a pattern in return profile of stocks indicates that even during the bad market conditions, the undervalued stocks can protect the investors interest to an extent.

- All the stocks (except smart link) included in the sample were able to deliver relatively good returns to their investors in 2009-10. Even though the gradual revival of investor confidence and the reinstatement of the stable political system of the country were the factors primly contributed such growth, the growth rate was remarkably high in case of most of the stocks which were

undervalued by the market in 2008-09. Of the five stocks which occupied foremost positions in terms of growth in value among the group, four were come from the undervalued group. When six of the undervalued stocks were able to produce a return at a rate which is three hundred per cent or more, only one of the overvalued stocks was able to generate return to its investors at that scale. It also found that the stock investments in small sized firms produced significantly higher rates of return than the similar investments in large sized companies. This showed the presence of size effect on market growth during the period.

- In all the periods of observation (except 2007-08) portfolio of undervalued stocks were received return (on average) at a rate which was much higher than the rate of return delivered by the market index. Overvalued stocks were able to beat the market in terms of return only in 2009-10. In all other years of observation the performance of overvalued stocks was poorer than the overall market performance. When the difference in mean returns of undervalued and overvalued stocks were tested with the help of parametric tool – t test, the difference found statistically significant at five per cent level (in 2005-06 and 2006-07) and at ten per cent level (in 2007-08). In 2009-10 the analysis did not observe the statistical significance of difference in the performance of two group stocks at any level. The continuity of the superior performance of undervalued stocks relative to the market as well as overvalued stocks reinforce the validity of the argument of the investment strategists in the use of Price Earnings ratio as the tool for earning excess returns from stock market investments.

7.2: Suggestions

Based on the insights gained from the study the following suggestions are made.

- Investors should be aware of speculative bubbles in the market. In the absence of strong fundamental indicators, shooting up of stock prices should be dealt with care and vigilance.

- Real economic variables such as interest rate, exchange rate and money supply continue to influence the stock market performance in India during the post reform period. This can be crucial input for policy makers and market regulators while drafting their policies governing the functioning of the financial system of the country.

- Foreign Institutional Investments (FIIs) have been a significant factor influencing the stock market behavior in India. Indian stock market provides ample space to the Foreign Institutional investors for the diversification of their funds and the high volatility faced by the market recent times can be attributed to the fluctuations in these investment flows. So when monitoring the movement of stock prices, the authorities should have to pay more attention to the FII inflows than that they have usually made in the past.

- Investment in sectors like FMCG which has the potential to insulate from the market fluctuations on account of its domestic market orientation and lower level labor intensity can be included in the portfolio by the investors for the diversification of their investment risks.

- Size of the return produced by the stocks of small and medium companies in India has been much better than the returns profile of the large cap stocks. So the investors can prefer fundamentally strong companies from small/medium segment while making decisions on their investment portfolios.

- Since in the long run value outperform growth stocks in India, the investors can use P/E ratio as a value strategy for identifying the undervalued stocks in constructing their investment portfolios and thereby they can make super returns there from.

- Indian accounting setting is highly conservative, hence making financial disclosure less transparent and value relevant for market participants. So the regulatory bodies provide constructive directions for improving the financial disclosure policies with in the Indian accounting setting.

7.3: Scope for further research

Major focus of any work in equity research area is to identify the variables which explain stock returns in a market. Since this study is mainly based on the variables specific to Indian Information Technology (IT) sector firms only, it is not clear as to how the results would generalize to sample of firms from industries with different characteristics. So the results of this study need to be reinforced by assessing the performance of all strategies considered under it with the sample of stocks from other sectors also. Similarly with the inclusion of samples from several international markets one can determine the universal acceptability of its findings. Both are possible and are certainly valuable lines of future research.

7.4: Conclusions

Fundamental approach is valid and can produce superior returns to investors who are committing funds in equity shares in Indian stock market on a long term perspective. Investors should assess the relative performance of the economy, the state of the industry and also the financial health of the companies before choosing a particular share as the medium for their financial investment. The linkage of the Indian stock market system with the external world, real economic activities in the country, capital intensity in the industry, earnings growth of individual firms, all are worth to consider for assessing the actual worth of a stock. Size effect is visible and investment in medium/small segments delivers better returns than the returns by large cap stocks. PE ratio could be effectively used as a tool for locating mispriced stocks in Indian stock market. Portfolio investment again helps the investors to blow up the returns and minimize the risks from their stock market investments. The results could be reinforced by assessing the performance of stocks from several international markets

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