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 causal 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. Moreover 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.
Summary of findings and conclusions

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
Summary of findings and conclusions

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 within 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.