CHAPTER VII

SUMMARY

A critical review of the results of the various investment models analysed in this study is included in this chapter. Investment models studied include Selection And Decision Models under Fundamental Analysis and Elton and Gruber Model and Capital Asset Pricing Model under Modern Portfolio Theory.

1) Selection Models:

The purpose of using selection models is two fold; one is to shortlist securities from a universe on the basis of some financial ratio and secondly to select a portfolio from the selected list. In this study, securities are selected by applying four models viz.,

a) Ranking
b) Sorting on the basis of Financial Ratios
c) Rating and
d) Selection based on a combination of some risk and reward financial factors (Modified Graham-Rea Model).

The model results have been evaluated under both bullish as well bearish market conditions. Market is taken as bullish if the return on the market index is positive and vice versa. Portfolios selected by the models have been found well diversified, that is securities from different industries have been selected. Other common feature of the selection is that few exceptional performers have found berth in the portfolios.
When the scrips selected by Selection Models were evaluated against the market proxy, the following have been noticed:

a) Scrip-wise analysis reveals that irrespective of trend prevailing in the market, negative returns were recorded by most of the securities in the portfolios.

b) Portfolios formed by applying Ranking Model could not beat the market during one year as well as two year holding periods.

c) When scrips are combined into portfolio by sorting select financial ratios, the results indicated the following:

   i) Return on Buy portfolios had recorded higher return than Sell portfolios when sorting is done on Net Profit to Net Worth and Net Profit to Assets ratios during both the evaluation periods. However, when companies are shortlisted by sorting on the basis of growth rate in earnings per share and market price, return on portfolio meant for disinvestments was higher than the buy shares.

   ii) The results of the portfolios selected can be termed time specific for the portfolios selected by Net Profit to Net Worth and Net Profit to Assets ratios could beat the market in May 1994 but registered under performance in May 1995.

   iii) When Earnings per share to market price is considered, sell portfolios had outperformed in bearish market and buy combination had under performed in bullish trend. Buy portfolios had recorded consistent negative returns and underperformance.
d) Portfolios selected by Rating Model also depicted inconsistency during the evaluation period.

Returns on securities selected by modified Graham-Rea Model were within a range and the portfolio had beaten the market index in bullish period whereas in bearish market the return on the portfolio was in tandem with Natex return. Better performance of this model as compared to Ranking / Rating may be due to the consideration of explicit risk-return parameters while shortlisting the securities. The portfolio selected by this model is also a diversified one.

It is clear from the analysis of various selection models that financial ratios used to measure growth, profitability etc., when used in isolation for identifying stocks for investment / disinvestments could not produce impressive results. A combination of growth, profitability, leverage and liquidity ratios gives better portfolio.

2. **Decision Models:**

Decision Models help the timing the entry in and exit from the stock market. The models considered for the study are:

- a) Dividend Discount Model (DDM)
- b) Earnings Discount Model (EDM)
- c) Price to BookValue (P/B) Model and
- d) Regression Analysis based Decision Model.

Securities for investment or disinvestments are categorized by comparing market prices with intrinsic values computed by the
models. The results of these various models are summarized as follows:

a) The number of companies selected by the DDM has been the least around 80 out of 120 shares included in the sample. It is followed by the regression model (around 85 companies), the EDM (around 100 companies) and lastly P/B model (around 90-100 companies).

b) The scrips selected and the portfolios made of them could be categorized in two broad categories viz., investment and disinvestment. Making inference on the basis of these categories period after period across the models is possible.

i) The number of shares selected by the DDM for investment during May 1994, November 1994 and May 1995 has been lower than scrips identified for disinvestments. In November 1995, the percentage of investment decisions to total number of decisions has recorded an improvement (around 45%) over the earlier periods (around 30%).

ii) In case of EDM, the ratio of investment to disinvestments scrip was 2:1 in 1994 and in Nov 95 it was around 4:1 with an exception in May 95 when the ratio was 3.7:6.3.

iii) The percentage of investment to total scrips identified by the P/B model had been above 60% in the first three periods and 74% in November 1995.
iv) The ratio of investment to disinvestments has been the highest in case of regression model that selected around 84% of buys in all periods of portfolio construction.

c) The ratio of investment to disinvestments given by timing models can be used to make inferences about market movements. If the numbers of sell decisions are more than buy decisions, the market can be said to be overvalued and a correction is due and vice versa. If this is so, market in the evaluation period should witness bearish trend during the evaluation period. These model results have been evaluated in four different periods. Therefore, it is possible to draw some conclusion on the basis of consistency of the ratios of these models.

i) The DDM’s selection of buy category scrips had been few in number in 1994 and the market was bearish in the subsequent evaluation period. The annual returns on market index were positive during the evaluation period for the portfolios selected in May 1995 and the model’s buy recommendation was more in number than in the November 1994.

ii) In case of other three models, the percentage of investment has been generally higher than disinvestments, thus making any inference on market movement was not possible.

d) Another yardstick applied to analyse the results of decision models is consistency in performance as measured by the ratio of success percentage in case of individual securities as well as on portfolio basis.
i) On portfolio basis the model based on discounted dividend stream had turned out consistent performance. The evaluation on the basis of the performance measures applied indicate that disinvestment portfolios had outperformed the market consistently during November 94 (bearish period), May 95 (bullish phase) and in November 96. Buy portfolios recorded mixed results that are they recorded consistent underperformance except in May 94 and 'Strong Buy' portfolio in November 94. Success percentage in case of individual securities can be said to be satisfactory with percentages generally in the range of above 50% and in some cases it was more than 80%.

ii) In case of the EDM and P/B model, the analysis shows that portfolios and shares identified for sale had consistently outperformed the market irrespective of market conditions prevailed. The success percentage was generally higher in case of categories for sale than for buying.

iii) Results of regression model were (consistently) contradictory in the sense that buy portfolio out performed in the bearish market and sell portfolio under performed in bullish market. When individual securities are considered, the success percentage has been impressive in case of buy decisions in three out of four evaluation periods.

In short, it can be said the performance of individual securities recorded good performance in May 1994 and in the last two periods they recorded under performance. Shares and portfolios
identified for disinvestments generally could beat the market in terms of both return as well as risk adjusted return basis. However, considering the consistency in the number of shares selected and the performance, it can be said that the scrips/portfolio selected by the DDM have been better than other models. A study of the portfolios selected by the DDM has been made. It has been observed that most of the shares in the buy or sell category remained in the portfolio over the periods. An analysis of the shares commonly selected by the DDM is given in the Annexure 3.

e) The portfolios identified by models under fundamental analysis had certain drawbacks. For instance, the buy portfolios identified by the DDM contained a less number of scrips than portfolios identified for sale. The portfolios selected by the regression model are lopsided with more buy decisions. Similarly, other decision models generally selected more shares under buy category. Under selection model, by applying Ranking or Rating model, investor can decide on the number of buy/sell securities to be included in the buy/sell portfolio and depending on the number chosen the level of diversification of the portfolio would vary.

f) A point to be noted here is that the portfolios selected by the fundamental models have in many cases beaten the market not only on return basis but also on risk adjusted return basis (Treynor Ratio). But these portfolios have not been constructed through optimal manner suggested by Modern Portfolio Theory. Even though portfolios have been generated by using selection as well as decision models, it is not possible to make comparison between the
portfolios identified for the simple reason that the objective of employing these models is very much different. Under decision model, an investor shortlists securities by applying certain financial parameters. Decision models help in identifying "mispriced" securities through a scientific process. Depending on the number of securities traded and the time available to collect, collate and process the information, the models under both selection and decision categories can be made use of by the investor. For instance, if the sample is fairly large, Graham-Rea type of selection model which considers risk as well as reward parameters can be considered for shortlisting the securities and the DDM can be applied for timing the decision.

3. **Elton and Gruber Model:**

This model has been considered with a view to selecting a portfolio that is risk-return optimal. Risk-return optimal portfolios have been generated and monitored for five consecutive periods.

a) The betas of individual securities included in the portfolio have generally been low.

b) During the annual monitoring period, it has been found that the portfolios selected by the model had outperformed the index in three periods out of five periods in the one year evaluation. In the long term, two out of five portfolios outperformed the Natex.

c) Number of shares included in the portfolio varied from period to period. The number of shares included in the portfolio was more in
October 1995 and April 1996. The recommended proportion of investment (though few shares in the portfolios were common in some cases) differed as well.

d) Concentration of investments in 4-6 shares (out of around 20 shares in the portfolio) is the major drawback of these portfolios. The impact cost incurred by the fund managers with a large fund would be quite sizable, if the recommendations of this model were to be followed.

An attempt has been made to compare this model results with that of DDM (a model which recorded consistent performance) results. Elton and Gruber Model results are risk-return optimal and the proportion in which funds to be invested are known and the same is not the case with the DDM. The composition of the portfolios is different. In case of former model, the decision is predominantly based on fundamental factors, while returns and risk parameters computed from share prices formed the basis of decision making in the later. Thus, the common feature of these portfolios is the dissimilarities.

However, an interesting point coming to the fore is that both the models beat the market in the initial period of the study (May 1994) and under performance of the portfolios were noticed in the last two monitoring periods. The number of shares selected by both these models has been more than the average number during the last two monitoring periods. Increase in holding period of the portfolio did not alter the results of both the models to large extent.
4. Capital Asset Pricing Model:

The model explains how capital assets are priced in the market place in an equilibrium situation. According to CAPM, the expected return on an efficient portfolio is equivalent to price of time plus price of risk times the amount of risk. The CAPM has applications in the areas of security selection, Portfolio construction and portfolio performance evaluation. This study clearly establishes that the CAPM does not hold good in the Indian scenario and the results are in tandem with the findings of other studies carried out in India as well as abroad. Therefore, identification of “mispriced” securities on the basis of return and systematic risk as measured by beta using the CAPM has not been possible.

Large institutional investors have a more diversified portfolio not only to minimize risk but also for the reasons of liquidity. When liquidity is included in optimal portfolio construction it has been found that the portfolio is more diversified than the standard Markowitz portfolios. When the potable portfolio analysis is extended towards the capital market equilibrium a generalised version of the Capital Asset Pricing Model which is consistent with empirical findings that otherwise diverge from the original model is obtained. These findings suggest that portfolio liquidity is a strategic objective that ought to be given the same attention as portfolio return and risk.
The results are summed up as follows:

a) Selection Models used for shortlisting securities on the basis of selective fundamental factors have not been found to turn out good performance in the study. However, when a set of fundamental factors covering risk and reward are combined and applied the performance has recorded improved results.

b) Decision Models used for timing the investment decisions have generally shown outperformance by shares/ portfolios identified for disinvestments and underperformance by most of the buy portfolios. The performance of Dividend Discount Model has been consistent in terms of portfolio composition, number of shares selected and the performance over the period.

c) Risk-return optimal portfolios selected by ranking the ratio of excess return to systematic risk (beta) outperformed market in the initial monitoring periods.

d) Identification of mispriced securities by applying the CAPM framework is not possible, as it has been found that the CAPM does not hold good in Indian market.

Institutional investors use investment models for portfolio construction and restructuring. The performance of mutual funds have regularly been analysed by investors to judge if 'selective buying or selling' of securities – a strategy used by fund managers – have done better than 'random picking' from the universe. This is analysed by comparing the performance of mutual funds on risk adjusted return basis because it is possible that the managed portfolio has
achieved higher return than 'buying-and-holding-the-market' by taking on considerably more risky investments.

A look at the financial literature on comparison of mutual funds' performance on return as well as risk adjusted return basis vis-à-vis market index reveals under performance by mutual funds. Two studies carried out in the sixties, which had evolved the performance measurement of professional investments, by Sharpe and Jensen confirmed the poor and inconsistent performance. Jensen concluded in his study that "the funds were on average not able to predict security prices well enough to outperform a buy the market and hold policy but also that there is very little evidence that any individual fund was able to do significantly better that that which we expected from mere random chance" Sharpe also reached similar conclusion by comparing Sharpe Index of a number of mutual funds with that of Dow Jones Industrial Average.

Performance of mutual funds in India is no exception. Given below is data of mutual fund schemes whose investment is predominantly in equities. The data has been sourced from the website of Value Research India, a leading mutual fund rating agency in the country. The returns are as on August 29, 2001 reckoned for a period of 12 months, 36 months and 60 months retrospective. It can be seen that the performance of open-end schemes has been better than close end fund scheme's performance. However, the performance of diversified equity fund scheme was not spectacular both in short as well as long run.
Various portfolio models analysed in this study also confirms that the performance of selective buy / sell strategy generally unable to beat the passive investment strategy of investing in market index. The investors in the index funds would have been better off than the users of stock/ industry/ market specific information for making investment/ disinvestment decisions. Comparatively better and consistent performance by Dividend Discount Model may be attributed to the robustness of the model. The DDM has been the basis for various decision models of intrinsic value computation. Individual and institutional investors also use these models.

Buffett, the most successful investor of recent times, applies a three-stage Dividend Discount Model for timing his decisions. The performance of equity investment portfolio of Life Insurance Corporation of India, whose main criteria for making equity
investment is the payment of dividend in three out of five years, had beaten variety of market indices on risk adjusted return basis.

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>( \frac{R_p - R_f}{\sigma_p} )</th>
<th>Return (%)</th>
<th>Risk (( \sigma ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIC's Portfolio</td>
<td>45.84</td>
<td>53.05</td>
<td>89.05</td>
</tr>
<tr>
<td>BSE SENSEX</td>
<td>42.70</td>
<td>56.05</td>
<td>103.16</td>
</tr>
<tr>
<td>RBI All India Index</td>
<td>44.37</td>
<td>38.20</td>
<td>59.05</td>
</tr>
<tr>
<td>BSE National Index</td>
<td>42.25</td>
<td>50.39</td>
<td>90.87</td>
</tr>
</tbody>
</table>

Risk free rate considered for computing risk adjusted return was 12% and the performance was evaluated in the year 1993-94.

The results of Elton and Gruber Model have also been found to be satisfactory. The model essentially captures the price movements in the market place and the return and risk parameters are computed only on the basis of share prices. Modern Portfolio Theory help investors in constructing diversified portfolios with explicit consideration of variance and covariance factors.

Another advantage of using this model is that the relevant company/industry news and macro economic factors, which have an impact on the working of the company, are reflected immediately in the share prices and are captured in the portfolio selection. Restructuring of portfolios/ revision of investment decision can be made at frequent intervals. (This may not be possible in case of models based on fundamental analysis for the reason that the working results of the company are available only once in a quarter).
Institutional investors like life insurance companies and general insurance companies and banks may make use of portfolio selection under Modern Portfolio Theory in conjunction with the traditional methods of individual stock analysis. This combined technique would help equity investment operations of the institutions in the following areas:

a) The beta coefficient, a quantitative measure of the relevant risk of individual securities, would help institutions to determine how the mix of securities in the portfolio affects the overall risk of the investible fund.

b) Performance evaluation and asset mix change can be undertaken with the help of Modern Portfolio Theory techniques.

There is scope for refinement of the results of this study:

a) Growth rate estimations used in Decision Models and beta estimation in Elton & Gruber Model may be based on projections rather than on the basis of past data.

b) Past data used for making estimations may be of a longer time period.

This study also offers scope for further research in the area of implementing some aspects of Modern Portfolio Theory in case of institutional investors whose equity investments are subject to regulatory and prudential exposure norms.