LEARNING OUTCOMES

After reading this chapter, you will be able to:

LO 12.1 Explain basic concept of managed portfolio—mutual fund and its performance evaluation

LO 12.2 Analyse different performance evaluation models—Sharpe’s index, Treynor’s index and Jensen’s index

LO 12.3 Understand the concept of portfolio revision and formulae plan

LO 12.4 Analyse the concept of rupee cost averaging

LO 12.5 Evaluate the concept of constant ratio plan and variable ratio plan

INTRODUCTION

The performance of a portfolio has to be evaluated periodically and rebalanced by replacing securities. One of the measures used for performance evaluation is Sharpe’s performance index. Besides Sharpe’s index, there are other models, such as Treynor’s performance measure, Jensen’s performance measure, etc., which are useful tools for assessing the performance of portfolios. We shall discuss these models in this chapter and examine their advantages and disadvantages vis-à-vis Sharpe’s performance index as a model for portfolio evaluation.

The various stages of portfolio management are: portfolio selection, construction, performance evaluation, and portfolio churning. Before closing our discussions, it is essential that we understand the techniques of managing portfolios. Portfolio management involves portfolio revision based on performance evaluation, which we discussed in the previous chapter. Traditionally, portfolio managers managed portfolios by replacing low performing securities with securities giving higher earnings. Modern portfolio managers use futures and options not only for hedging the portfolio risk, but for enhancing the portfolio returns as well. In this chapter, we shall discuss these issues.

PERFORMANCE EVALUATION

Once the portfolio is created, the performance of the portfolio has to be evaluated based on the objectives set at the time of the construction of the portfolio. The objectives will clearly mention the risk–return perception of the investor. If the evaluation is done looking at only the return from the portfolio, it is not in accordance with the portfolio’s investment objectives as it does not take into account this risk–return relationship. For example, if an investor does not want to take any
risk and if we compare his portfolio return with the Nifty return, the evaluation may not be perfect as Nifty always carries certain amount of risk. However, such comparison is possible with mutual fund return having the same risk perception as the investor can choose funds considering the risk aspect as well. Hence, mutual funds can be considered as a benchmark portfolio. The portfolio manager can use this, discuss with the investor regarding his preferred fund, and finally arrive at a consensus before selecting a fund for evaluative purposes.

**MUTUAL FUNDS**

A mutual fund is a pool of assets consisting of equity, debt, commodity, realty, index, etc., or a combination of two or more of the aforementioned assets. These are portfolios of securities selected based on certain criteria. Each fund is managed by a fund manager and evaluated for its performance periodically. The mutual funds are ranked according to their performance based on valuation models, such as Sharpe index, Treynor’s performance measure, Jensen’s performance measure, and so on. Hence, the performance evaluation method used in the case of mutual funds can be used as a benchmark measuring parameter for evaluating the performance of portfolios.

**Advantages of Mutual Funds**

1. **Professional Management:** Mutual funds provide the services of experienced and skilled professionals, backed by a dedicated investment research team that analyses the performance and prospects of companies and selects suitable investments to achieve the objectives of the scheme. Individual investors lack such expertise.

2. **Diversification:** Mutual funds invest in a number of companies across a broad cross-section of industries and sectors. This diversification reduces the risk because seldom do all stocks decline at the same time and in the same proportion. Investors can achieve this diversification through mutual funds with far less money than they can do on their own.

3. **Convenient Administration:** Investing in a mutual fund reduces paperwork and helps one to avoid many problems, such as bad deliveries, delayed payments, and follow-ups with brokers and companies. Mutual funds save time and make investing easy and convenient.

4. **Economy of Operation:** Mutual funds pool large amount of funds which can be invested in a wide spectrum of securities. With mutual funds, investors can buy when the market is low and sell when the market is high. Because of the large-scale operations of mutual funds, their presence in the market can influence and create movements within the latter.

5. **Return Potential:** Over a medium to long-term period, mutual funds have the potential to provide a higher return as they are invested in a diversified basket of selected securities.

6. **Low Costs:** Mutual funds are a relatively less expensive mode of investment compared to direct investments in the capital markets because of the benefits of the former, such as scale in brokerage, custodial and other fees that translate into lower costs for investors.

7. **Liquidity:** In open-ended schemes, the investor gets the money back promptly at net asset value related prices from the mutual fund. In close-ended schemes, the units can be sold on a stock exchange at the prevailing market price or the investor can avail of the facility of direct repurchase at NAV related prices by the mutual fund.

8. **Transparency:** Mutual funds require giving out regular information on the value of investment in addition to disclosure on the specific investments made by the scheme, the proportion invested in each class of assets, and the fund manager’s investment strategy and outlook.

9. **Flexibility:** Through features such as regular investment plans, regular withdrawal plans, and dividend reinvestment plans, investors can systematically invest or withdraw funds according to the investors’ needs and convenience.

10. **Affordability:** Individually investors may lack sufficient funds to invest in high-grade stocks. A mutual fund, because of its large corpus, allows even a small investor to avail the benefit of its investment strategy.

11. **Wider Choice of Schemes:** Mutual funds offer a variety of schemes to suit the investor’s varying needs over a lifetime.

12. **Better Regulated:** All mutual funds are registered with the Securities and Exchange Board of India (SEBI) and they function within the provisions of strict regulations designed to protect the interests of investors. The operations of mutual funds are regularly monitored by SEBI.
Performance of Mutual Funds

The performance of mutual funds is measured based on their Net Asset Value (NAV) and return. NAV is the aggregate market value of all securities held in a portfolio minus the permitted operating expenses for managing the fund divided by the total number of units in the fund. Mutual funds are issued in terms of unit and the purchase value is also in terms of price per unit. The NAV is also quoted in terms of units. The difference between the purchase price and current NAV shows the growth of an investment. Table 12.1 below shows the performance of close-ended equity fund having mid and small cap stock in the portfolio.

**Table 12.1** NAV and one-Year Returns of Close-Ended Equity—Mid and Small Cap—as on January 12, 2011

<table>
<thead>
<tr>
<th>Fund</th>
<th>NAV</th>
<th>Returns (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religare Mid &amp; Small Cap</td>
<td>14.4</td>
<td>24.14</td>
</tr>
<tr>
<td>HSBC Small Cap</td>
<td>13.01</td>
<td>21.39</td>
</tr>
<tr>
<td>Canara Robeco Multi Cap</td>
<td>16.25</td>
<td>19.84</td>
</tr>
<tr>
<td>ICICI Prudential Fusion Inst I</td>
<td>16.21</td>
<td>19.54</td>
</tr>
<tr>
<td>ICICI Prudential Fusion</td>
<td>15.29</td>
<td>17.98</td>
</tr>
<tr>
<td>ICICI Prudential R.I.G.H.T.</td>
<td>12.17</td>
<td>16.68</td>
</tr>
<tr>
<td>HDFC Long-term Equity</td>
<td>16.51</td>
<td>16.39</td>
</tr>
<tr>
<td>Reliance ELSS Series I</td>
<td>14.98</td>
<td>15.9</td>
</tr>
<tr>
<td>Tata Tax Advantage 1</td>
<td>16.77</td>
<td>14.91</td>
</tr>
<tr>
<td>L&amp;T Tax Advantage Series I</td>
<td>21.79</td>
<td>14.87</td>
</tr>
</tbody>
</table>

*Source: www.valueresearchonline.com (accessed on 12/01/2011)*

The performance of the funds shown in the table above helps us to compare between funds and select the best among them. The comparison of NAV requires the NAV for a previous period also. Return-wise we can find which fund is performing the best. We can also evaluate the performance of an individual fund as shown in Table 12.2 below:

**Table 12.2** Performance of HSBC Small Cap as on January 12, 2011

<table>
<thead>
<tr>
<th>Current Stats and Profile</th>
<th>Trailing Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latest NAV</td>
<td>Fund Category</td>
</tr>
<tr>
<td>13.0105 (12/01/2011)</td>
<td>Equity: Mid &amp; Small Cap</td>
</tr>
<tr>
<td>52-Week High</td>
<td>3-Month</td>
</tr>
<tr>
<td>52-Week Low</td>
<td>–10.49</td>
</tr>
<tr>
<td>10.0568 (24/02/2010)</td>
<td>1-Month</td>
</tr>
<tr>
<td>1-Month</td>
<td>3.21</td>
</tr>
<tr>
<td>1-Year</td>
<td>–1.28</td>
</tr>
<tr>
<td>1-Year</td>
<td>–4.6</td>
</tr>
<tr>
<td>5-Year</td>
<td>–4.71</td>
</tr>
<tr>
<td>5-Year</td>
<td>–12.28</td>
</tr>
<tr>
<td>3-Year</td>
<td>21.39</td>
</tr>
<tr>
<td>3-Year</td>
<td>12.28</td>
</tr>
<tr>
<td>Return Since Launch</td>
<td>9.63</td>
</tr>
<tr>
<td>Net Assets (Cr)</td>
<td></td>
</tr>
<tr>
<td>58.05 (31/12/2010)</td>
<td></td>
</tr>
<tr>
<td>Benchmark</td>
<td></td>
</tr>
<tr>
<td>BSE Small Cap</td>
<td></td>
</tr>
<tr>
<td>Returns up to 1 year are absolute and over 1 year are annualised.</td>
<td></td>
</tr>
</tbody>
</table>

*Source: www.valueresearchonline.com (accessed on 12/01/2011)*
Table 12.2 gives information about a specific fund. This information will help us to understand the performance of a fund since its launch.

Every investor will be interested to know whether the management of a mutual fund is better served by buying and selling securities selectively at an appropriate time rather than indiscriminately buying large number of securities from the market and holding them throughout the period. One of the methods of measuring the performance of a mutual fund is by comparing yields of the portfolio with the market return or the return from a random portfolio. The portfolio–yield formula can be compared with the holding-period–yield formula for stock.

\[
\frac{NAV_t + D_t}{NAV_{t-1}} - 1
\]  

(12.1)

Where;

\[NAV_t = \text{Per share net asset value at the end of year } t\]
\[D_t = \text{The total of all distributions – both income and capital gains – per share during year } t\]
\[NAV_{t-1} = \text{Per share net asset value at the end of the previous year}\]

For example, if \(NAV_t = ₹13.01\), \(D_t = ₹2\), \(NAV_{t-1} = 10.01\), the yield will be:

\[
\frac{13.01 + 2}{10.01} - 1 = 1.50 - 1 = 0.50 \text{ or } 50\%
\]

This yield can be compared to a managed portfolio and an unmanaged one. The portfolio which gives the highest one-year-holding-period yield is, by this criterion, considered to be the better option.

Table 12.1 shows the NAV and return of close-ended funds with mid and small cap stocks. Nifty mid cap annual return at the end of December 2010 was 19.61 per cent. It may be observed that only three funds have shown returns above Nifty mid cap and one fund is marginally lower than Nifty. All others are below Nifty mid cap returns. Table 12.3 below shows performance of funds ranked on a long-term basis:

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>1-Y Return (%)</th>
<th>1-Y Rank</th>
<th>3-Y Return (%)</th>
<th>3-Y Rank</th>
<th>5-Y Return (%)</th>
<th>5-Y Rank</th>
<th>7-Y Return (%)</th>
<th>7-Y Rank</th>
<th>10-Y Return (%)</th>
<th>10-Y Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franklin FMCG</td>
<td>31.61</td>
<td>2/3</td>
<td>16.3</td>
<td>2/3</td>
<td>16.39</td>
<td>1/3</td>
<td>22.29</td>
<td>2/3</td>
<td>19.05</td>
<td>2/3</td>
</tr>
<tr>
<td>ICICI Prudential FMCG</td>
<td>21.21</td>
<td>3/3</td>
<td>4.16</td>
<td>1</td>
<td>13.82</td>
<td>1</td>
<td>25.6</td>
<td>1/3</td>
<td>21.38</td>
<td>1/3</td>
</tr>
<tr>
<td>Magnum FMCG</td>
<td>41.73</td>
<td>1/3</td>
<td>17.73</td>
<td>1/3</td>
<td>16.21</td>
<td>2/3</td>
<td>21.74</td>
<td>3/3</td>
<td>17.03</td>
<td>3/3</td>
</tr>
</tbody>
</table>

Source: www.valueresearchonline.com (accessed on 12/01/2011)

The above table shows three mutual funds with FMCG stock as its components ranked in terms of their performance for 10 years. It may be observed that the rank of a fund changes from year to year as the return goes up or down. However, merely measuring and comparing the returns on a managed and unmanaged portfolio will not be sufficient. The following factors should also be considered while comparing an unmanaged fund with a managed one:

1. In the case of a managed fund, an investor needs to pay the management fee. The value of equity will come down to the extent of the front-end load charges levied by a fund (in the case of a load fund). Hence, the investor should ascertain whether the excess return generated by buying the fund is sufficient to meet these additional charges rather than buying a diversified portfolio on his/her own and paying commission/brokerage on the transactions.

2. In a managed portfolio, the fund manager’s risk perception is an influencing factor. The fund could have generated more profit compared to an unmanaged fund had the fund manager invested in more high-risk assets whereas in an unmanaged portfolio, the investor enjoys this option.

Without considering the above factors, the analysis of performance based on a comparison between managed funds and unmanaged funds will become meaningless.
Sharpe’s performance index gives a summary measure for portfolio performance by making proper adjustments for the underlying risk. This index gives, as single value for ranking, the performance of various funds or portfolios. The index measures the risk premium of the portfolios in relation to the total portfolio risk. The risk premium is the difference between the average rate of return of the portfolio and the risk-free rate of return. The risk of a portfolio is indicated by its standard deviation. The index assigns the best value to the assets which carry the best risk-adjusted average rate of return. The Sharpe index is given by:

$$\text{Sharpe Index} = \frac{\text{Average Portfolio Return} - \text{Risk-free Rate of Interest}}{\text{Standard Deviation of the Portfolio Return}}$$

Graphically, the Sharpe index can be represented as shown in Fig. 12.1.

The formula can be converted into the following equation:

$$S_i = \frac{R_p - R_f}{\sigma_p}$$

(12.2)

Where:

- $S_i$ = Sharpe index
- $R_p$ = Average return on portfolio $p$
- $R_f$ = Risk-free rate of return
- $\sigma_p$ = Standard deviation of portfolio $p$

It can be observed from the above formula that the Sharpe index measures the risk premium of the portfolio, which represents the excess return the investors may demand for bearing the total risk in the portfolio.

As shown graphically in Fig. 12.1, the index, $S_i$, measures the slope of the line starting from the risk-free rate of return and proceeding towards the portfolio in question. Thus, the Sharpe index summarises the risk and return of a portfolio in a single measure. This categorises the performance of the fund on a risk-adjusted basis. This can be further clarified with the help of the following example:

**Example 12.1**

A portfolio (A) is constructed including M&M, SBI, and Suzlon. The average return of this portfolio is 0.409 and standard deviation is 0.039. Another portfolio (B) is constructed in which M&M, SBI, Suzlon, Infosys, and Dr. Reddy’s are the components. The average return of this portfolio is 0.453 and the standard deviation is 0.019. Risk-free interest in both the cases is 0.05. Applying the above equation, the Sharpe index can be computed as follows:

- Portfolio A = $\frac{0.409 - 0.05}{0.039} = 9.25$
- Portfolio B = $\frac{0.453 - 0.05}{0.019} = 21.54$

Portfolio B is ranked as the better portfolio because its index is higher ($21.54 > 9.25$) than the index of portfolio A because of two reasons:

1. The average return on portfolio B is higher than portfolio A (45.30 > 40.90)
2. The standard deviation of B is less than portfolio A (0.019 < 0.039).
TREYNOR’S PERFORMANCE INDEX

Treynor has introduced the concept of the ideal fund. The ideal fund is represented by the characteristic line which can be linear or curved. The characteristic line is the relationship between the fund’s return and the market return. The relationship shows that the fund’s return grows faster than the market return, whereas, when the market return declines, the fund’s return drops at a slower pace. This is because the ideal fund may have lesser-risk investments, such as treasury bills, and the fund manager may also short sell the stock when the market declines in order to generate positive returns. The relationship between the fund’s return and market return is plotted in Fig. 12.2.

![Fig. 12.2 Treynor’s Characteristic Line of an Ideal Fund](image)

The fund’s return is plotted on the vertical axis and market return is plotted on the horizontal axis. The slope of the characteristic line is the beta coefficient, which measures the portfolio’s systematic risk. It may be observed in the figure that while the market return increases, the portfolio return also increases whereas, when the market return declines, the portfolio return climbs down even slower. The characteristic line shows this relationship. The characteristic line can be drawn by plotting the fund’s return for a given period against the market return for the same period. The volatility of the fund’s return is evidenced by the slope of the line. If the characteristic line is very steep, it is an indication of the fund’s sensitiveness to the market performance. The slope of the characteristic line can be estimated using the following equation:

\[ R_p = \alpha + \beta R_m + e_p \]  \hspace{1cm} (12.3)

Where:
- \( R_p \) = Portfolio return
- \( R_m \) = Market or index return
- \( e_p \) = Error term or the residual
- \( \alpha, \beta \) = Coefficient to be estimated

The following diagram (Fig. 12.3) will show how the performance of three funds (X, Y, Z) can be graphically plotted:

![Fig. 12.3 Market Return and Fund Return](image)
The only difference between the Treynor model and the Sharpe performance index is that the former has replaced the standard deviation as the denominator with beta. The beta value of market is always 1.00. The beta coefficient for the best performing portfolio is computed with the help of regression analysis using the return on the best portfolio as the dependent variable and the returns on the market as the independent variable.

\[ T_n = \frac{R_p - R_f}{\beta_p} \]  

(12.4)

Where:
- \( T_n \) = Treynor Index
- \( R_p \) = Portfolio return
- \( R_m \) = Market or index return
- \( \beta_p \) = Beta coefficient of the portfolio

**Example 12.2**

Portfolio A consists of Suzlon, Goldbees, Coal India, BPCL, and ONGC. The average return of this portfolio is 0.126 and beta is 0.755. Portfolio B consists of ICICI Bank, Axis Bank, PNB, Infosys, and TCS. The average return of this portfolio is 0.219 and beta is 1.128. The risk-free rate of return is 0.05. From this data, we can compute the Treynor index of the two portfolios as follows:

Portfolio A = \( \frac{0.126 - 0.05}{0.755} = 0.101 \)

Portfolio B = \( \frac{0.219 - 0.05}{1.128} = 0.150 \)

The analysis shows that portfolio B is better than portfolio A as the index value of B is higher than A. Fig. 12.4 below shows the performance of portfolio A and portfolio B in terms of Treynor’s performance measure:

**JENSEN’S PERFORMANCE INDEX**

The absolute risk-adjusted measure, commonly known as Jensen’s measure was developed by Michel Jensen. Jensen’s model has some similarities with the Sharpe and Treynor models. According to the Sharpe and Treynor models, intercept of the line is at the origin whereas the Jensen’s model identifies the intercepts at any point including the origin.

The Jensen measure is obtained by computing the regression on the differences between the portfolio return and the risk-free rate of return. In other words, we can compute the excess average return above the risk-free return and use this value to arrive at the index. Jensen measure can be computed with the help of the following formula:

\[ \bar{R}_p = \alpha_p + \beta(\bar{R}_m - R_f) \]  

(12.5)

Where:
- \( \bar{R}_p \) = Average return of portfolio
- \( R_f \) = Risk-free rate of return
- \( \alpha_p \) = Intercept that measures the forecasting ability of the portfolio manager
- \( \beta \) = A measure of systemic risk
- \( \bar{R}_m \) = Average market return
It may be observed from the formula above that the portfolio return varies in the same proportion of the beta to the difference between the market return and risk-free rate of interest. The systemic risk is represented by the beta. If all the market securities are included in the portfolio, the fund’s portfolio beta would be equal to 1. When securities are higher in risk than a portfolio, all market securities are also included in the portfolio, and then the beta tends to be greater than 1. Figure 12.5 shows the relationship between beta and fund’s return:

An efficient fund manager will always aim at earning an average portfolio return of \( \bar{R}_p = R_f + \beta (\bar{R}_m - R_f) \). More efficient fund managers will be able to earn higher returns than other funds at each level of risk provided his ability to predict is superior. If the fund manager performs above the average return \( \bar{R}_p \) consistently, there may be some factors which have enabled him to earn a higher return. This constant factor can be termed as the \( \alpha_p \), which represents the forecasting ability of the fund manager. Thus, the equation 12.5 can be rewritten as follows from the previous argument:

\[
\bar{R}_p - R_f = \alpha_p + \beta (\bar{R}_m - R_f) \quad (12.5a)
\]

In other words:

\[
\bar{R}_p = R_f + \alpha_p + \beta (\bar{R}_m - R_f) \quad (12.5b)
\]

**Jensen’s Measure of Management Ability**

Jensen’s measure of management ability is shown in Fig. 12.6. Slopes X, Y and Z represents Jensen’s measure of the performance of a fund manager. The upper line Y represents a case of superior management, where: \( \bar{R}_p = R_f + \alpha_p + \beta (\bar{R}_m - R_f) \) indicating ability of the manager to generate extra returns through better management ability. Line X shows the neutral performance, where the value of \( \alpha = 0 \) indicating that the management has done as well as an unmanaged market portfolio or a randomly selected portfolio with inexperienced buying and holding strategy, where: \( \bar{R}_p = R_f + \beta (\bar{R}_m - R_f) \). The third line Z shows under performance where the \( \alpha \) has a negative value. This indicates inferior management as the management has acted along the lines of an unmanaged portfolio, where: \( \bar{R}_p = R_f + \alpha_p + \beta (\bar{R}_m - R_f) \). This situation arises because of the insufficiency of the portfolio returns to meet the selection, maintenance and management of the process. Hence, Jensen’s measure involves two steps:

1. Computation of expected return using the equation 12.5, and
2. Comparing the expected return obtained in the first step with the actual return with the help of \( \beta, \bar{R}_m \) and \( R_f \).

If the actual return is above the expected return, it indicates that the portfolio has performed well whereas, if the actual return is below the expected return, it shows poor performance. The following example will numerically explain the concept:

**Example 12.3**

Three portfolios, A, B and C were created consisting of the following securities as represented in Table 12.4:
Table 12.4  Comparative Details of three Portfolios: A, B and C

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Scrip</th>
<th>Purchase Price</th>
<th>Market Price</th>
<th>Return</th>
<th>Security Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Suzlon</td>
<td>43</td>
<td>51.5</td>
<td>19.77</td>
<td>2.76</td>
</tr>
<tr>
<td></td>
<td>Gold Bees</td>
<td>1575</td>
<td>2004</td>
<td>27.24</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Coal India</td>
<td>365</td>
<td>395</td>
<td>8.22</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>BPCL</td>
<td>488.4</td>
<td>660.5</td>
<td>35.24</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>ONGC</td>
<td>996</td>
<td>1296.95</td>
<td>30.22</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td></td>
<td></td>
<td>24.14</td>
<td>0.755</td>
</tr>
<tr>
<td>B</td>
<td>ICC Bank</td>
<td>712</td>
<td>1110</td>
<td>55.90</td>
<td>2.03</td>
</tr>
<tr>
<td></td>
<td>Axis Bank</td>
<td>915.8</td>
<td>1284.9</td>
<td>40.30</td>
<td>2.04</td>
</tr>
<tr>
<td></td>
<td>PNB</td>
<td>845</td>
<td>1212.75</td>
<td>43.52</td>
<td>1.17</td>
</tr>
<tr>
<td></td>
<td>Infosys</td>
<td>2329</td>
<td>3317.95</td>
<td>42.46</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>TCS</td>
<td>685.25</td>
<td>1155</td>
<td>68.55</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td></td>
<td></td>
<td>21.86</td>
<td>1.128</td>
</tr>
<tr>
<td>C</td>
<td>Infosys</td>
<td>2329</td>
<td>3317.95</td>
<td>42.46</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>TCS</td>
<td>685.25</td>
<td>1155</td>
<td>68.55</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>Coal India</td>
<td>598.2</td>
<td>664.65</td>
<td>11.11</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Tata Steel</td>
<td>449.1</td>
<td>667.2</td>
<td>48.56</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>Dr. Reddy’s</td>
<td>1065.65</td>
<td>1717.05</td>
<td>61.13</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td></td>
<td></td>
<td>46.36</td>
<td>0.584</td>
</tr>
</tbody>
</table>

From the above information we can compute the parameters required for computing Jensen’s measure, represented in Table 12.5 below:

Table 12.5  Portfolio Return and Market Return for Computation of Jensen’s Measure

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>( \bar{R}_p )</th>
<th>( B )</th>
<th>( R_f )</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24.14</td>
<td>0.755</td>
<td>5%</td>
</tr>
<tr>
<td>B</td>
<td>21.86</td>
<td>1.128</td>
<td>5%</td>
</tr>
<tr>
<td>C</td>
<td>46.36</td>
<td>0.584</td>
<td>5%</td>
</tr>
<tr>
<td>Nifty</td>
<td>17.35</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The return can be computed from the above data applying the equation 12.5 as follows:
Return on Portfolio A = 5 + 0.755(17.35 – 5) = 14.32
Return on Portfolio B = 5 + 1.128(17.35 – 5) = 18.93
Return on Portfolio C = 5 + 0.584(17.35 – 5) = 12.21

The difference between the actual and expected rates of return is worked out as follows:
Portfolio A = 24.14 – 14.32 = 9.82
Portfolio B = 21.86 – 18.93 = 2.93
Portfolio C = 46.36 – 12.21 = 34.15

The above analysis shows that portfolio C is the super performer as the measure obtained is higher than that of the other two portfolios. Portfolio A can be considered the poorest performer as its value is negative.

In this chapter, we have discussed three different approaches to measure the performance of portfolios. One common factor that we can discern from these three approaches is the use of risk-adjusted return measurement. As we have seen at the beginning of this chapter, prior to the development of these measures, traditionally, the performance of portfolio managers involved
an observation of the rate of return generated by the portfolio over a period of time. In this method, the portfolio managers were required to demonstrate that the portfolio they managed generated returns equal to or exceeding the return generated by an unmanaged portfolio during a specified period of time. Another method of measuring performance is checking whether the portfolio manager can successfully obtain a beta for the portfolio that he manages and which is consistent with the objectives of the investor for his individual portfolio. In other words, a criterion of performance measurement is whether the portfolio manager assumes the same level of risk that the investor assumed in his investments. Another measure that could be considered is evaluating the ability of the portfolio manager to diversify the unsystematic risk, because such risks can be completely diversified by properly constructing the portfolio. An efficient market will only pay for the market or systematic risk. Several criticisms have already been raised against all these models. We, therefore, feel that it is better to follow a combination of different models rather than depending on a single paradigm.

**LEARNING OUTCOME 12.3**

**CONCEPT OF PORTFOLIO REVISION**

Once created, a portfolio should be reviewed and revised periodically so as to take advantage of the prevailing market conditions. The portfolios will be churned if necessary due to price change or fundamental changes in existing companies. Stock markets fluctuate heavily responding to various events, news, and so on. Such fluctuations often give ample opportunities to investors to earn high profits. But generally, investors are reluctant to trade in a highly volatile market. Many investors are shy to sell in a bull market and buy from a bear market. They buy some scrips and keep the same with them. The only income they earn is the periodical dividend that they receive from the company. They fail to take advantage of the capital appreciation. For them, capital appreciation includes the bonus shares, rights shares, bonus debentures, etc., distributed by the company once in a while. Many investors do not have a specific investment policy. If there is an investment policy which is focused on market appreciation instead of returns, the stocks should be revised accordingly.

Sometimes investors sell the stocks in their hand when the stocks move below their 200-day simple moving average, because 200DSMA is considered as a major support level for the stocks. There are investors who hold stocks in a bull market even if it has breached all its previous price targets, but sell once it moves below 16 per cent from its all time high. Different fund managers and investors have different tactics for portfolio churning. Some of the constraints of regular portfolio churning are:

1. **Statutory constraints**: Different institutions have different stipulations, which may not allow the portfolio managers to churn the portfolios on a regular basis.
2. **Transaction costs**: Portfolio with billions of rupees as assets under management are difficult to churn on a regular basis because of their high impact costs.
3. **Taxes**: The short-term capital gain tax in India is 15 per cent, hence, selling securities on a regular basis is not advantageous. Buying and selling of securities attract taxes and cess.

Often, markets are highly volatile and the stocks fluctuate heavily. Traditionally, investors fail to book profit when the prices reach the peak and buy when they hit the bottom level. Rather, many of them prefer to hold the stock indefinitely. Sometimes, the stock prices may fall substantially and touch even prices below the face value of these shares. In such cases, these investors suffer heavy losses. Portfolio revision enables the investors to follow the market and drop those stocks that are incurring losses and shift the investments to high-return ones. Portfolio revision means a change in the debt–equity ratio, removal of one company from the portfolio and an addition of new companies, and completely removing one sector while adding a new sector to the portfolio. A continuous monitoring and revision is necessary for an optimum portfolio. The commonly used tools for portfolio revision are security analysis, risk–return evaluation, and the Markowitz model. Portfolio revision may also necessitate—in case of availability of additional funds or withdrawal of existing funds—changes in risk–return attitudes.
Traditionally, portfolio constructions and revisions were done manually. However, nowadays, computer programs are available for selection of stocks. These programs identify undervalued stocks by analysing the relationship between stocks and the market sectors. Quantitative ‘screens’ and factor models are now used by portfolio managers to construct portfolios of stocks with low P/E ratios, low price/book ratios, small capitalisation, or high dividend yields. These factors are often neglected by analysts. These programs also identify stocks, the returns of which are strongly correlated with economic variables, such as interest rates. There are computer programs which detect trading patterns and place buy-and-sell orders depending on past price movements. For example, Metastock shows buy-and-sell signals on the stock/index chart, which helps the investors to place suitable orders based on the market trend. Algo-trading programs have computer-aided order placing systems, in which the computers track the prices and execute the orders much quicker than manual operations. Computers also check the relationships between stock options and futures markets and place orders across the market to take advantage of arbitrage opportunities from small price differences.

The modern portfolio managers need not depend too much on the security selection process. They can adopt asset allocation strategies and enhance the portfolio returns to investors. For example, a portfolio manager can adopt tactical asset allocation strategy in which he splits the funds into stocks and bonds after analysing and finding out which class of assets will perform better in the coming period. In this process, the portfolio manager correctly predicts the broad market movements rather than depending on the trends of individual companies. Similarly, another strategy is insured asset allocation strategy in which the portfolio manager limits the investment losses by shifting funds between the existing equity portfolio and risk-free assets depending on the market conditions. Another strategy is including equity derivatives, such as futures, options, and swaps in the portfolio which can assist the portfolio manager in shifting a portfolio’s exposure to systematic and unsystematic risks. The portfolio management styles can generally be classified into passive management style and active management style.

**Passive Management Style**

Passive management style, as the name indicates, implies passive attitude of the portfolio manager. He may visit the market only for buying the stocks or selling for liquidity. Passive management style can be buy-and-hold strategy or indexing strategy.

**WHY IS PORTFOLIO REVISION NECESSARY?**

In 2010, the cut-throat competition among telecommunication-sector companies led to price wars thereby decreased revenue growth, which forced many fund managers to reduce exposure to telecommunication stocks in their portfolio.

In 2010, India witnessed huge inflationary trends. This necessitated the Reserve Bank of India (RBI) to increase the lending rate on a constant basis affecting the interest rate sensitive sectors, such as banking and real estate, to a certain extent. Most of the funds reduced exposure to real estate stocks, which led to a heavy selling pressure within this sector.

In 2011, the environment and forests’ ministry notified Plastic Waste Rules, 2011, which replaced the previous Recycled Plastics Manufacture and Usage Rules, 1999. According to this new ordinance, no food stuffs will be allowed to be packed in recycled plastics or compostable plastics. It also underlined the uniform thickness, which shall not be less than 40 microns, in carry bags. Companies which are engaged in the area of packing materials, especially containers, sashes, etc., witnessed heavy sell off after this new amendment.

In early 2010, base metals in London Metal Exchange had surged to an all time high; Copper, Aluminium, Tin, and Zinc prices gained sharply. This created a high demand of metal stocks across the globe. A lot of institutional investors, including FIIs, allocated more funds and increased stakes in metals stocks.
Buy-and-Hold Strategy

Under this style, the portfolio manager follows a long-term strategy of buy and hold. The stocks or bonds purchased under this strategy are held for a longer period and are not sold following the market trend. Bonds are held till their maturity. This restricts the portfolio from gaining advantage from the price of movements in the market. This reduces the chances of maximising the portfolio return. Often, securities in the portfolio are sold for liquidity and the value realised will be that which prevails on the date when the sale takes place. As a result, if the security prices had moved up and touched the peak during the holding period, the portfolio manager fails to book this profit due to his passive attitude and the sale at the prevailing market price can either bring lower return or even loss.

One of the easiest ways to invest wisely is holding a portfolio for a long term. Usually, investors find good quality stocks and do not churn the portfolio in the short term. Investments in index stocks or replicating the indices are also considered passive ways of portfolio management. There are fund managers who invest in few index heavyweight stocks with a high beta nature. If the markets are bullish, their portfolio with high beta gives them high returns. Conversely, fund managers create portfolios with low beta during a bear market to tame price deterioration of their portfolios.

Indexing

Stocks are purchased by selecting those stocks that have matching returns with index returns. The portfolio return will track index returns over a period of time. This process is better known as ‘indexing’ because it tracks the index. Occasional rebalancing is necessary because the stocks may be dropped from the index or new stocks may be added to it based on the performance of stocks in the index. The purpose of tracking an index is not beating the target index but following the performance of the index and matching the portfolio performance with the index performance. The efficiency of a portfolio manager is judged by evaluating how much the deviation of performance of the portfolio could be minimised from the performance of the index. In the case of bond portfolios also, the buy-and-hold and indexing strategies are followed. Indexing enables the portfolio manager to identify tracking error, which indicates the deviation of individual security return from the index return.

Active Management Style

Here the fund manager finds out the timing for entry and exit at an early stage. Buying stocks of particular sectors, which are going to get budgetary support ahead of the budget and selling them after the budget announcement, is an active way of portfolio management. Buying railway related stocks before the railway budget and selling them on the day of the budget announcement or on the day after is another example. Buying more stocks from outperforming sectors in the index and allocating lower amounts to the low performing sectors on the indices is another method of active management. Here the fund manager is more active than a fund manager who manages his funds under passive management.

In active portfolio management, the fund management identifies a benchmark portfolio which is a passive portfolio with average characteristics (including factors such as beta, dividend yield, industry weighting, and firm size) and matching the risk–return objectives of the client. Under active portfolio management, a fund manager can adopt growth stock approach, undervalued stock approach, small capitalisation approach, or market timer approach.

Growth Stock Approach

The growth stock approach works under the basic premise that companies having above average earnings growth over a time will tend to produce stock values that will lead to above average returns to the investor. Hence, the manager will select those stocks having historically highest above average earnings growth and those that he feels will also continue to have above average growth in earnings. Stocks selected on this basis carry systematic and unsystematic risks.

Undervalued Stock Approach

Those who practice this approach are often managers seeking high yield and those who are on the lookout for companies having high dividend yield, low market-to-book value ratio or low
P/E ratios. This is because of their desire to achieve high current income. There is an alternative approach known as out-of-favour stocks, which are stocks with low P/E ratios. At various times in the economic cycles, certain stocks representing certain specific sectors may not be favoured by the investors. For example, at certain points of time in the economic cycle, investors may not favour automobile stocks simply due to the reason that an economic recession may pull down demand for vehicles due to low purchasing power of people during such periods. Consequently, number of buyers for stocks of companies in this sector may come down whereas the sellers of these stocks will increase, which will in turn bring down their prices. Sometimes they drop way out of line with the earnings of these companies thereby deteriorating the P/E ratios. When P/E ratios drop down, managers buy these stocks.

Small Capitalisation Approach

Traditionally, the managers of funds, such as pension funds, mutual funds, etc., did not buy stocks of small companies. But, subsequently when small companies started performing extremely well, there was a shift in their investment strategies. Consequently, smaller companies also attracted more funds, a process better known as the small capitalisation approach.

Market Timer Approach

A portfolio manager, who is a market timer, varies the proportion of some stocks in his portfolio based on his views on the stock market on a particular point of time. He may vary the proportion of stocks he holds versus bonds versus cash; or he may vary the proportion of his holdings in specific industries. For example, IT stocks can change the trend of Nifty in the Indian stock market because of the prominent position of the stock of companies in the IT sector. The market time approach enables rotation of stocks in a portfolio or specific groups of stocks in a portfolio.

The approaches discussed above constitute the active management strategy because in each case the fund manager makes affirmative decisions regarding selection of securities based on his philosophy of investments. The fund managers may also use various formula plans for selection of the securities.

FORMULA PLANS

Before floating a fund, the fund manager and advisors usually decide the proportion of investments in various asset classes, such as stocks, debenture, and so on. Formula plans provide the basic rules and regulations for buying and selling of securities. Fund managers and advisors also decide the adoption of various formula plans, such as rupee cost averaging, constant rupee value, dollar cost averaging, etc., in order to fix the amount to be invested. The formula plans help the managers to allocate the available funds among aggressive and conservative portfolios. The aggressive portfolios include the securities with high growth and high risk. The return on these portfolios is highly volatile because share prices fluctuate. The conservative portfolios consist of bonds and fixed income securities. The returns on the latter are fixed and certain. They act as a buffer against the volatility of aggressive portfolios. Basically, conservative portfolios display slow fall in the prices of bonds and debentures as well.

Assumptions of the Formula Plan

Formula plan operates on the following assumptions:

1. Investors generally allocate their funds among common stocks and fixed income securities in such proportion as per the prevailing market condition, say 30 per cent in common stock and 70 per cent in bonds or vice versa. They may also change this proportion as the market condition changes. In a balanced fund, the investors may maintain a proportion of 50 per cent in common stock and 50 per cent in fixed income securities.

2. An upward trend in the market may result in a decline of stocks in the portfolio or the proportion of stocks may remain constant. In a declining market, the portfolio will be more aggressive and in an upward market, the portfolio will be defensive.

3. The stocks are bought and sold whenever there is a significant change in the prices in the market. Such changes in the prices of stocks can be measured with the help of stock indices,
such as the Bombay Stock Exchange (BSE), SENSEX (Sensitive Index), or Standard & Poor’s CRISIL NSE Index (S&P CNX Nifty).

4. The investors continue to strictly follow the formula plan once adopted and never change it.

5. Investors choose stocks which move along with the market reflecting the market’s risk and return. The prices of the selected stocks move in tandem with the market movement. The beta of these stocks will be around 1.0. These stocks belong to fundamentally strong companies.

Advantages of the Formula Plan

1. It provides the basic rules and regulations for buying and selling of securities.
2. This plan has rigid rules and regulations so as to overcome human emotions.
3. The plan enables an investor to earn higher returns.
4. The plan suggests a course of action to meet the objectives set by the investor.
5. It controls the buying and selling of securities by the investor.
6. It is highly helpful in deciding the optimum timing of investments.

Disadvantages of the Formula Plan

1. The plan does not provide help for the selection of securities which has to be done based on technical or fundamental analyses.
2. No adjustment is possible as the rules are rigid and strict.
3. The transaction cost will be high for short-term transactions; hence, the plan can be adopted only for long-term investments.
4. Formula plan does not help the investors in market forecasting, which has to be done separately and based on technical or fundamental analyses.

LEARNING OUTCOME 12.4

RUPEE COST AVERAGING

Here the portfolio manager buys stocks at every decline in a phased manner. If the stock price falls, the investor buys more stocks than when it rises. For example, if a fund manager identifies TCS stock as his best pick of the year, and he decides to deploy around ₹1 crore for purchasing the stock when it was at ₹1800. A 10 per cent fall in TCS will help the fund manager enlarge his portfolio. He deploys 50 per cent of the allocated amount in buying the stock. In the next quarter, it comes up with impressive results and the stock gains over 20 per cent. Here the portfolio manager allocates lesser amount of money. Assuming that the stock may gain by another 10 per cent in the next quarter, the portfolio manager usually deploys a very small amount for buying the TCS stock. The basic idea behind this rupee cost averaging is that it enables the fund manager to rely on the mathematical advantage of ‘averaging out’. The creation of rupee cost averaging is also known as ‘pyramid portfolios’. Table 12.6 represents the rupee cost averaging effect on Infosys stock for a given period of time:

Table 12.6 Rupee Cost Averaging Effect on Infosys Stock (01.01.2010 to 31.03.2010)

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Market Price (₹)</th>
<th>Shares Bought</th>
<th>Total Number of Shares Bought</th>
<th>Cumulative Investments (₹)</th>
<th>Market Value per Share (₹)</th>
<th>Unrealised Profit or Loss (₹)</th>
<th>Average Cost per Share (₹)</th>
<th>Average Market Price per Share (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-Mar-10</td>
<td>2636.83</td>
<td>500</td>
<td>500</td>
<td>1318415</td>
<td>1318415</td>
<td>0</td>
<td>2636.83</td>
<td>693.07</td>
</tr>
<tr>
<td>02-Jun-10</td>
<td>2639.43</td>
<td>1000</td>
<td>1500</td>
<td>3957845</td>
<td>3959145</td>
<td>1300</td>
<td>2638.56</td>
<td>2638.13</td>
</tr>
<tr>
<td>02-Sep-10</td>
<td>2753</td>
<td>2000</td>
<td>3500</td>
<td>9463845</td>
<td>9635500</td>
<td>171655</td>
<td>2703.96</td>
<td>2696.22</td>
</tr>
<tr>
<td>02-Dec-10</td>
<td>3082.83</td>
<td>200</td>
<td>3700</td>
<td>10080411</td>
<td>11406471</td>
<td>1326060</td>
<td>2724.43</td>
<td>2917.92</td>
</tr>
</tbody>
</table>

Source: www.nseindia.com (accessed on 14/01/2011)
By adopting this strategy, the average cost of the Infosys stock became ₹2724.43 while the current market price remained at ₹3082.83.

**Benefits of Rupee Cost Averaging**

Some of the benefits of rupee cost averaging are enumerated below:

1. It reduces the average cost per share and enhances the chances to earn higher gains in the long run.
2. The timing of stock purchase is eliminated.
3. The investor can decide which funds are to be invested periodically and plan the investment programme accordingly; the implementation process is mechanical.
4. Though the programme functions in both bullish and bearish markets, it is even more effective for buying stocks in a falling market.
5. A fixed sum of money can be regularly invested over a period of time and it averages the cost.

**Limitations of Rupee Cost Averaging**

1. The purchase and sale of stock periodically involve transaction cost; hence the total impact cost will be higher compared to a one-time lump sum investment.
2. It is a strategy for investment; hence, does not specify when to sell.
3. The process of selection of securities is not eliminated.
4. It does not indicate standard periodical intervals for making stock purchases.
5. In a falling market, the averaging effect does not bring profits.
6. The plan is more effective in cyclical stock price movements.

Rupee cost averaging is more effective and brings better results when applied to no-load funds as the high transaction costs and stock selection are eliminated. It helps to reduce the cost through the averaging process and helps in earning profit provided it is applied to the case of broad based index funds and if the price is volatile. The investor only needs to decide the amount to be invested periodically and the length of the period of investment.

**CONSTANT RUPEE PLAN**

Under the constant rupee plan, an investor should invest in two different portfolios, i.e., aggressive portfolio and defensive portfolio. Aggressive portfolio consists of stocks and defensive portfolio consists of bonds. Whenever the aggressive portfolio gives a reasonable amount as profit, the investor books the profits and the same will be further invested in defensive portfolios. In a downward moving market, aggressive portfolio values decline faster. In that situation, the investor transfers funds from the defensive portfolio to aggressive portfolios to buy more stocks for cost averaging. Here the investor predefines the period and amount that shall be transferred from one portfolio to another.

<table>
<thead>
<tr>
<th>Table 12.7</th>
<th>Constant Rupee Plan for Wipro Shares and Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period</strong></td>
<td><strong>Market Price (₹)</strong></td>
</tr>
<tr>
<td>Jan-10</td>
<td>645.26</td>
</tr>
<tr>
<td>Bought 100 Shares</td>
<td></td>
</tr>
<tr>
<td>Feb-10</td>
<td>676.4</td>
</tr>
<tr>
<td>Sold 15 shares and bought IRFC 12.90%</td>
<td></td>
</tr>
<tr>
<td>Mar-10</td>
<td>713.68</td>
</tr>
<tr>
<td>Sold 9 shares and bought 65 Powergrid 12.25% bonds</td>
<td></td>
</tr>
<tr>
<td>Apr-10</td>
<td>678.82</td>
</tr>
<tr>
<td>May-10</td>
<td>666.52</td>
</tr>
<tr>
<td>Jun-10</td>
<td>383.48</td>
</tr>
<tr>
<td><strong>Source:</strong> <a href="http://www.nseindia.com">www.nseindia.com</a> (accessed on 10/4/2011)</td>
<td></td>
</tr>
</tbody>
</table>
In the above plan (Table 12.7), the investor has a portfolio worth ₹2 lakh which he started in January 2010 by buying 100 shares of Wipro. In February, when Wipro prices shoot up he books the profit and reinvests this profit in 12 per cent IRFC bonds by buying 31 bonds at a price of ₹101.32. In March also, the stock prices move up and he books the profit and buys 65 Power Grid Corp. 12.25 per cent bonds at a price of ₹105.71. From April onwards, the stock prices decline and then he buys shares. Here he has two options, either to dispose of the defensive portfolio and reinvest in stocks or bring additional investments retaining the defensive portfolio. In this case, the investor retains the bonds and buys additional funds to make her total portfolio value worth ₹2 lakh.

LEARNING OUTCOME 12.5

CONSTANT RATIO PLAN

Here the fund manager deploys funds at the ratio of 1 : 1 in both the defensive and aggressive portfolios. During the period of investment, the fund manager always keeps the ratio constant. He will have a predetermined time period to evaluate both the portfolios.

For example, a fund manager invested ₹1,00,000 each in aggressive and defensive portfolios. After the completion of the first year of investment (predetermined revaluation period), the value of the aggressive portfolio value stood at ₹1,40,000. This enabled the fund manager to book profits in the aggressive portfolio and he sold shares worth ₹20,000 and reinvested the same in the defensive portfolio thereby making both portfolios values equal (1:1).

During the portfolio revaluation period, if the fund manager finds that the aggressive portfolio value has declined by around 15 per cent, then the fund manager will sell part of the defensive portfolio and the same will be reinvested in the aggressive portfolio to keep the investment ratio at 1:1.

<table>
<thead>
<tr>
<th>Table 12.8</th>
<th>Constant Ratio Plan (Ranbaxy Stock and IRFC Bonds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market price (₹)</td>
<td>No. of stocks in stock portfolio</td>
</tr>
<tr>
<td>601.33</td>
<td>167</td>
</tr>
<tr>
<td>551.64</td>
<td>167</td>
</tr>
<tr>
<td>543.52</td>
<td>167</td>
</tr>
</tbody>
</table>

Sold 45 bonds and bought 28 shares

543.52 | 195 | 105986 | 95056 | 201042 | 01:01  |

Source: www.nseindia.com (accessed on 10/04/2011)

In the above Table 12.8, the investor holds a portfolio of equity and debt. When the prices started declining, he sold a certain number of bonds and reinvested in stocks to balance the ratio at a constant level of 1:1. Generally, investors prescribe certain percentage of movement of prices to start the rebalancing process in order to maintain the ratio.

The advantage of this system is that it forces the managers to counter adjust his portfolio cyclically. In this process also, the selection of securities has to be done by the investor. The limitation of this process is that equal portion is invested in bond portfolios. Bond market is a part of capital market, and hence any adverse movements in the capital market may affect the bond portfolio as well.

VARIABLE RATIO PLAN

Under this method, the investor has the freedom to revise his portfolio components. If the price of the aggressive portfolio falls, the investor may shift components of the conservative portfolio to the aggressive portfolio according to his wish. When the share price rises, he sells the aggressive portfolio and shifts the amount to conservative portfolios. This plan requires forecasting of share prices and hence is best suitable in a volatile market condition.
Table 12.9: Variable Ratio Plan (Stock JP Associates-Bonds-IDFC 6.5 per cent and Exim Bank Zero Coupon)

<table>
<thead>
<tr>
<th>Share Price (₹)</th>
<th>No. of Shares</th>
<th>Value of Shares (₹)</th>
<th>Value of Defensive portion (₹)</th>
<th>Total Portfolio Value (₹)</th>
<th>Stock as Percentage of Portfolio</th>
<th>Portfolio Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>96.47</td>
<td>104</td>
<td>10032.88</td>
<td>10001.1</td>
<td>20034</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>87.48</td>
<td>100</td>
<td>8748</td>
<td>10001.1</td>
<td>18749.1</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>81.17</td>
<td>100</td>
<td>8117</td>
<td>10001.1</td>
<td>18118.1</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>74.53</td>
<td>145</td>
<td>10807</td>
<td>9227</td>
<td>20034</td>
<td>54</td>
<td>Sold 98 bonds and bought 45 shares</td>
</tr>
<tr>
<td>85.05</td>
<td>145</td>
<td>12332</td>
<td>9227</td>
<td>21559</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>88.32</td>
<td>145</td>
<td>12806</td>
<td>9227</td>
<td>22033</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>90.4</td>
<td>111</td>
<td>10034</td>
<td>10000</td>
<td>20034</td>
<td>50</td>
<td>Sold 34 shares and bought 14 Exim Bank Zero Coupon Bonds</td>
</tr>
</tbody>
</table>

Source: www.nseindia.com (accessed on 26/03/2011)

In Table 12.9, the investor has created a portfolio consisting of 104 JP Associate’s stocks and 106, 6.5 per cent IDFC 2013 bonds. The investor has fixed adjustment of portfolio above 5 per cent. Since the adjustment criteria are fixed by the investor, it can differ from individual to individual based on their risk perception. The total portfolio value of ₹20,000 is divided into two equal portions and each adjustment is shown in the table. When the price dropped to as low as ₹74.53, the investor sold 98 bonds and bought 45 shares thereby balancing the portfolio back to above 50 per cent. In the second leg, when the prices rose to ₹90.40, the investor booked profit by selling 34 shares and buying 14 Exim Bank 2013 Zero Coupon Bonds thereby bringing back the portfolio balancing to 50 per cent.

Advantages of the Variable Ratio Plan

1. The flexible rules permit the investor to make corrections and rebalance the portfolio when the price changes as per the standard norm fixed by him.
2. The investor is not emotionally affected by the market trend.
3. The ability to forecast accurately will enable the investor to take maximum advantage of the price fluctuations in the market.

Disadvantages of the Variable Ratio Plan

1. The investor has to follow the market trend and change the proportions periodically to balance the portfolio.
2. The plan does not help in the selection of securities, a process that the investor has to undertake on his own after analysing various stocks.
3. If the range fixed is too small, frequent changes may become necessary, which will increase the transaction cost.

DOLLAR COST AVERAGING

Dollar cost averaging is an effective market-timer mechanism that eliminates the need to time the market. All one has to do is to invest a stipulated amount of money on a regular basis over a long period of time for buying stocks or portfolios. Since the amount is constant, the investor is able to buy more units (quantity of stocks) when the price is lower and only a small quantity in a bull market. As a result, average cost of acquisition of the stock will always be less than the average market price of a stock irrespective of a falling, rising, or fluctuating market.

Based on studies (January 1, 1994 to January 1, 2004), an individual who has invested ₹1,000 every year made a return of 9 per cent. If an investor invested just ₹1,000 on January 1, 1994, he
might have earned only 5 per cent. The dollar cost averaging is otherwise known as SIP ‘Systematic Investment Plan’. A lot of monthly salaried investors prefer this investment avenue to beat market fluctuations.

**PORTFOLIO REVISION AND TRANSACTION COST**

The portfolio revision depends greatly on the investor’s perception on risk and return. A risk taking investor will be prepared to take higher risks for higher returns, whereas a risk-averse investor’s preference will be risk-less portfolios. Some investors may look for regular and steady returns from the portfolio. The portfolio manager has to keep this in mind while revising the portfolio. Portfolio revision involves buying and selling of securities, which involves transaction costs. The transaction cost represents the brokerage, bid-ask spread, and the impact cost. Bid-ask spread is the difference between the buying and selling price quoted by the market makers. Impact cost is the impact of volume of trade on the price movement. For example, if stocks are purchased in bulk quantities, the prices may rise on account of higher demand. Portfolio revision is done to enhance the return or reduce the risk. These costs may be more in the case of smaller stocks and often the benefit of portfolio revision will be nullified because the cost overtakes the benefits.

**Key Terms**

**Mutual fund**: A pooling of funds for investment in market.

**Managed portfolio**: A pool of funds managed using portfolio principles, like a mutual fund.

**Performance evaluation**: Evaluation of risk-return of mutual funds from their investment worthiness.

**Systematic risk**: Risk arising on account of system wide factors.

**Unsystematic risk**: Risk arising on account of company/industry specific factors.

**Diversification**: An activity to minimise risk.

**Beta of mutual fund**: A measure of responsiveness of mutual fund’s return to market return.

**Total risk of mutual fund**: Sum total of systematic risk and unsystematic risk.

**Statutory constraints**: Different institutions and regulatory bodies impose restrictions on portfolio management, these restriction are statutory constraints.

**Transaction**: Cost of buying and selling the assets like brokerage, taxes etc. incurred at the time of portfolio balancing.

**Passive management style**: Strategy of buy-and-hold.

**Active portfolio management style**: Style based on tactical allocation of assets.

**Tactical allocation**: Allocating corpus of portfolio as per changing market situation.

**In Review**

Every security carries systematic and unsystematic risk. While unsystematic risk could be completely diversified by properly constructing a portfolio of securities, systematic risk is common to the market and cannot be diversified. Therefore portfolio evaluation is needed which enables assessment of risk and return of different portfolios. These can either be managed portfolio or mutual funds. Performance of mutual funds can be accepted as benchmark as they involve
pooling of funds from investors by selling units and investing the funds thus committed in various securities. Mutual funds can be open-ended or close-ended funds.

Sharpe’s index is used to measure risk premium related to the total risk or the portfolio. The Treynor’s index measures the performance of funds in relation to the market performance. The Jensen’s index compares the actual or realised return with the predicted/expected return.

The significance of portfolio revision and the constraints faced in portfolio revision are unique for any portfolio. Portfolio revision enhances the portfolio return by balancing the portfolio in tune with the market conditions. Modern portfolio managers follow tactical asset allocation strategies and ensure asset allocation strategically. Portfolio managers follow both passive portfolio management and active portfolio management. Passive portfolio management strategy is the policy of buy-and-hold strategy. Active portfolio strategy consists of formula plans. The important formulae plans are rupee cost averaging, constant ratio plan, variable ratio plan and dollar cost averaging. Portfolio revision involves transaction costs hence frequent portfolio revision might have adverse impact on portfolio return.

Multiple-Choice Questions

1. ______ can be used as benchmark measuring parameter for evaluating portfolio performance:
   (a) CAPM  (b) NAV  
   (c) Mutual funds  (d) Index of market

2. If the average annual return of a portfolio is 9.50% with a risk-free rate of return 8.25% and standard deviation of 0.0789, what will be its Sharpe’s performance index?
   (a) 1.58  (b) 0.58  
   (c) 0.158  (d) 0.0158

3. The excess average return of portfolio A is 10.50%, beta is 1.35, and excess average return of the market is 9.50%. The Jensen’s index would be:
   (a) 2.325  (b) –2.323  
   (c) –3.235  (d) –2.325

4. Average rate of return is 13.25%, beta is 0.595, risk-free rate of return is 7.25%, then the Treynor’s index is:
   (a) 0.10  (b) 1.00  
   (c) 1.10  (d) 0.010

5. The _____ is the relationship between the fund’s return and the market return:
   (a) SML  (b) CML  
   (c) Characteristic line  (d) None of these

6. Generally, investors like to trade in a volatile market.
   True/False

7. Conservative portfolios include the securities with high growth and high risk.
   True/False

8. Constant ratio plan reduces the cost through the averaging process and helps to earn profit if applied in the case of broad based index funds and if the price is volatile.
   True/False

9. Under variable ratio plan, the investor has the freedom to revise portfolio components.
   True/False

10. Dollar cost averaging is an effective mechanism that eliminates the need to go through the rigorous process of securities selection.
    True/False
Concept Questions

1. From the following information relating to two portfolios, find out which portfolio has better performance using Sharpe’s index.

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Average return (%)</th>
<th>Standard deviation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio X</td>
<td>15.05</td>
<td>12</td>
</tr>
<tr>
<td>Portfolio Y</td>
<td>17.50</td>
<td>23</td>
</tr>
<tr>
<td>Risk free interest</td>
<td>6.50</td>
<td></td>
</tr>
</tbody>
</table>

2. From the following information relating to two portfolios, find out which portfolio has better performance using Treyner’s index.

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Average return (%)</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio X</td>
<td>15.05</td>
<td>1.2</td>
</tr>
<tr>
<td>Portfolio Y</td>
<td>17.50</td>
<td>2.3</td>
</tr>
<tr>
<td>Risk free interest</td>
<td>6.50</td>
<td></td>
</tr>
</tbody>
</table>

Return on market portfolio is 12%.

3. Compute Jensen’s Performance index from following data:
   Return from X and Y portfolio is 20% and 25% respectively, respective beta is 1.00 and 1.50. Risk free return and return on market portfolio are 6% and 18% respectively.

4. Explain the concept of ‘mutual funds’. Why do people make invest in mutual funds?

5. Discuss the advantages of mutual funds.

6. How performance of a mutual fund can be evaluated? Give example.

7. Write a note on ‘Sharpe’s Index’.

8. Explain the concept of the ‘Jensen’s Index’.

9. Explain the need for portfolio revision and examine the constraints faced by a portfolio manager in this respect.

10. Define ‘formula plan’. Examine the advantages and disadvantages of it.

11. Explain ‘rupee cost averaging’ with example.

12. Distinguish between rupee cost averaging and dollar cost averaging.

13. Compare and contrast the use of constant ratio plan with variable ratio plan.

14. Differentiate between portfolio revision and portfolio balancing.

15. Define two categories of assets as required for portfolio revision.

16. “An investor holding pure equity portfolio does not need portfolio revision.” Do you agree?