CHAPTER 8
PORTFOLIO REVISION AND EVALUATION

- Meaning of portfolio revision
- Constraints in portfolio revision
- Portfolio revision strategies – formula plans
- Portfolio evaluation – need, evaluation perspective and meaning
- Differential return and decomposition of performance
PORTFOLIO REVISION:

Meaning of Portfolio Revision:

A portfolio is a mix of securities selected from a vast universe of securities. Two variables determine the composition of a portfolio; the first is the securities included in the portfolio and the second is the proportion of total funds invested in each security.

Portfolio revision involves changing the existing mix of securities. This may be effected either by changing the securities currently included in the portfolio or by altering the proportion of funds invested in the securities. New securities may be added to the portfolio or some of the existing securities may be removed from the portfolio. Portfolio revision thus leads to purchases and sales of securities. The objective of portfolio revision is the same as the objective of portfolio selection, i.e. maximising the return for a given level of risk or minimising the risk for a given level of return. The ultimate aim of portfolio revision is maximisation of returns and minimisation of risk.

Constraints in Portfolio Revision:

Portfolio revision is the process of adjusting the existing portfolio in accordance with the changes in financial markets and the investor’s position so as to ensure maximum return from the portfolio with the minimum of risk. Portfolio revision or adjustment necessitates purchase and sale of securities. The practice of portfolio adjustment involving purchase and sale of securities gives rise to certain problems which act as constraints in portfolio revision. Some of these are as under:

Transaction cost:

Buying and selling of securities involve transaction costs such as commission and brokerage. Frequent buying and selling of securities for portfolio revision may push up transaction costs thereby reducing the gains from portfolio revision. Hence, the transaction costs involved in portfolio revision may act as a constraint to timely revision of portfolio.
Taxes:

Tax is payable on the capital gains arising from sale of securities. Usually, long-term capital gains are taxed at a lower rate than short-term capital gains. To qualify as long-term capital gain, a security must be held by an investor for a period of not less than 12 months before sale. Frequent sales of securities in the course of periodic portfolio revision or adjustment will result in short-term capital gains which would be taxed at a higher rate compared to long-term capital gains. The higher tax on short-term capital gains may act as a constraint to frequent portfolio revision.

Statutory stipulations:

The largest portfolios in every country are managed by investment companies and mutual funds. These institutional investors are normally governed by certain statutory stipulations regarding their investment activity. These stipulations often act as constraints in timely portfolio revision.

Intrinsic difficulty:

Portfolio revision is a difficult and time consuming exercise. The methodology to be followed for portfolio revision is also not clearly established. Different approaches may be adopted for the purpose. The difficulty of carrying out portfolio revision itself may act as a constraint to portfolio revision.

Portfolio revision strategies:

Two different strategies may be adopted for portfolio revision, namely an active revision strategy and a passive revision strategy. The choice of the strategy would depend on the investor’s objectives, skill, resources and time.

Active revision strategy involves frequent and sometimes substantial adjustments to the portfolio. Investors who undertake active revision strategy believe that security markets are not continuously efficient. They believe that securities can be mispriced at times giving an opportunity for earning excess returns through trading in them. Moreover, they believe that different investors have divergent or heterogeneous expectations regarding the risk and return of securities in the market. The practitioners of active revision strategy are confident of developing better
estimates of the true risk and return of securities than the rest of the market. They hope to use their better estimates to generate excess returns. Thus, the objective of active revision strategy is to beat the market.

Active portfolio revision is essentially carrying out portfolio analysis and portfolio selection all over again. It is based on an analysis of the fundamental factors affecting the economy, industry and company as also the technical factors like demand and supply. Consequently, the time, skill and resources required for implementing active revision strategy will be much higher. The frequency of trading is likely to be much higher under active revision strategy resulting in higher transaction costs.

Passive revision strategy, in contrast, involves only minor and infrequent adjustment to the portfolio over time. The practitioners of passive revision strategy believe in market efficiency and homogeneity of expectation among investors. They find little incentive for actively trading and revising portfolios periodically.

Under passive revision strategy, adjustment to the portfolio is carried out according to certain predetermined rules and procedures designated as formula plans. These formula plans help the investor to adjust his portfolio according to changes in the securities market.

Formula plans:
In the market, the prices of securities fluctuate. Ideally, investors should buy when prices are low and sell when prices are high. If portfolio revision is done according to this principle, investors would be able to benefit from the price fluctuations in the securities market. But investors are hesitant to buy when prices are low either expecting that prices will fall further lower or fearing that prices would not move upwards again. Similarly, when prices are high, investors hesitate to sell because they feel that prices may rise further and they may be able to realize larger profits.

Thus, left to themselves, investors would not be acting in the way required to benefit from price fluctuations. Hence, certain mechanical revision techniques or
procedures have been developed to enable the investors to benefit from price fluctuations in the market by buying stocks when prices are low and selling them when prices are high. These techniques are referred to as formula plans.

Formula plans represent an attempt to exploit the price fluctuations in the market and make them a source of profit to the investor. They make the decisions on timings of buying and selling securities automatic and eliminate the emotions surrounding the timing decisions. Formula plans consist of predetermined rules regarding when to buy or sell and how much to buy and sell. These predetermined rules call for specified actions when there are changes in the securities market.

The use of formula plans demands that the investor divide his investment funds into two portfolios, one aggressive and the other conservative or defensive. The aggressive portfolio usually consists of equity shares while the defensive portfolio consists of bonds and debentures. The formula plans specify predetermined rules for the transfer of funds from the aggressive portfolio to the defensive portfolio and vice versa. These rules enable the investor to automatically sell shares when their prices are rising and buy shares when their prices are falling.

There are different formula plans for implementing passive portfolio revision; some of them are as under:

**Constant Rupee value plan:**

This is one of the most popular or commonly used formula plans. In this plan, the investor constructs two portfolios, one aggressive, consisting of equity shares and the other, defensive, consisting of bonds and debentures. The purpose of this plan is to keep the value of the aggressive portfolio constant, i.e. at the original amount invested in the aggressive portfolio.

As share prices fluctuate, the value of the aggressive portfolio keeps changing. When share prices are increasing, the total value of the aggressive portfolio increases. The investor has to sell some of the shares from his portfolio to bring down the total value of the aggressive portfolio to the level of his original
investment in it. The sale proceeds will be invested in the defensive portfolio by buying bonds and debentures.

On the contrary, when share prices are falling, the total value of the aggressive portfolio would also decline. To keep the total value of the aggressive portfolio at its original level, the investor has to buy some shares from the market to be included in his portfolio. For this purpose, a part of the defensive portfolio will be liquidated to raise the money needed to buy additional shares.

Under this plan, the investor is effectively transferring funds from the aggressive portfolio to the defensive portfolio and thereby booking profit when share prices are increasing. Funds are transferred from the defensive portfolio to the aggressive portfolio when share prices are low. Thus, the plan helps the investor to buy shares when their prices are low and sell them when their prices are high.

In order to implement this plan, the investor has to decide the action points, i.e. when he should make the transfer of funds to keep the rupee value of the aggressive portfolio constant. These action points, or revision points, should be predetermined and should be chosen carefully. The revision points have a significant effect on the returns of the investor. For instance, the revision points may be predetermined as 10 per cent, 15 per cent, 20 per cent, etc. above or below the original investment in the aggressive portfolio. If the revision points are too close, the number of transactions would be more and the transaction costs would increase reducing the benefits of revision. If the revision points are set too far apart, it may not be possible to profit from the price fluctuations occurring between these revision points.

**Example:**

Let us consider an investor who has Rs. 1,00,000 for investment. He decides to invest Rs. 50,000 in an aggressive portfolio of equity shares and the remaining Rs. 50,000 in a defensive portfolio of bonds and debentures. He purchases 1250 shares selling at Rs. 40 per share for his aggressive portfolio. The revision points are fixed as 20 per cent above or below the original investment of Rs. 50,000.
After the construction of the portfolios, the share price will fluctuate. If the price of the share increases to Rs. 45, the value of the aggressive portfolio increases to Rs. 56,250 \((1250 \times \text{Rs. } 45)\). Since the revision points are fixed to 20 per cent above or below the original investment, the investor will act only when the value of the aggressive portfolio increases to Rs. 60,000 or falls to Rs. 40,000. If the price of the share increases to Rs. 48 or above, the value of the aggressive portfolio will exceed Rs. 60,000. Let us suppose that the price of the share increases to Rs. 50, the value of the aggressive portfolio will be Rs. 62,500. The investor will sell shares worth Rs. 12,500 \((250 \times \text{Rs. } 50)\) and transfer the amount to the defensive portfolio by buying bonds for Rs. 12,500. The value of the aggressive and defensive portfolios would now be Rs. 50,000 and Rs. 62,500 respectively. The aggressive portfolio now has only 1000 shares valued at Rs. 50 per share.

Let us now suppose that the share price falls to Rs. 40 per share. The value of the aggressive portfolio would then be Rs. 40,000 \((1000 \times \text{Rs. } 40)\) which is 20 per cent less than the original investment. The investor now has to buy shares worth Rs. 10,000 \((250 \times \text{Rs. } 40)\) to bring the value of the aggressive portfolio to its original level of Rs. 50,000. The money required for buying the shares will be raised by selling bonds from the defensive portfolio. The two portfolios now will have values of Rs. 50,000 (aggressive) and Rs. 52,500 (i.e. Rs. 62,500 – Rs. 10,000) (defensive), aggregating to Rs. 1,02,500. It may be recalled that the investor started with Rs. 1,00,000 as investment in two portfolios.

Thus, when the ‘constant rupee value plan’ is being implemented, funds will be transferred from one portfolio to the other, whenever the value of the aggressive portfolio increases or declines to the predetermined levels.

**Constant Ratio plan:**

This is a variation of the constant rupee value plan. Here again the investor would construct two portfolios, one aggressive and the other defensive with his investment funds. The ratio between the investments in aggressive portfolio and the defensive portfolio would be predetermined such as 1:1 or 1.5:1 etc. The purpose of this plan is to keep this ratio constant by readjusting the two portfolios when share
prices fluctuate from time to time. For this purpose, a revision point will also have to be predetermined.

Suppose the revision points may be fixed as \( \pm 0.10 \). This means that when the ratio between the values of the aggressive portfolio and the defensive portfolio moves up by 0.10 points or moves down by 0.10 points, the portfolios would be adjusted by transfer of funds from one to the other.

Let us assume that an investor starts with Rs. 20,000, investing Rs. 10,000 each in the aggressive portfolio and the defensive portfolio. The initial ratio is then 1:1. He has predetermined the revision points as \( \pm 0.20 \). As share price increases the value of the aggressive portfolio would rise. When the value of the aggressive portfolio rises to Rs. 12,000, the ratio becomes 1.2:1 (i.e. Rs. 12,000 : Rs. 10,000). Shares worth Rs. 1,000 will be sold and the amount transferred to the defensive portfolio by buying bonds. Now, the value of both the portfolios would be Rs. 11,000 and the ratio would become 1:1.

Now let us assume that the share prices are falling. The value of the aggressive portfolio would start declining. If, for instance, the value declines to Rs. 8,500, the ratio becomes 0.77:1 (i.e. Rs. 8,500 : Rs. 11,000). The ratio has declined by more than 0.20 points. The investor now has to make the value of both portfolios equal. He has to buy shares worth Rs. 1,250 by selling bonds for an equivalent amount from his defensive portfolio. Now the value of the aggressive portfolio increases by Rs. 1,250 and that of the defensive portfolio decreases by Rs. 1,250. The values of both portfolios become Rs. 9,750 and the ratio becomes 1:1.

The adjustment of portfolios is done periodically in this manner.

**Dollar cost averaging:**

This is another method of passive portfolio revision. All formula plans assume that stock prices fluctuate up and down in cycles. Dollar cost averaging utilizes this cyclic movement in share prices to construct a portfolio at low cost.

The plan stipulates that the investor invest a constant sum, such as Rs. 5,000, Rs. 10,000, etc. in a specified share or portfolio of shares regularly at periodical
intervals, such as a month, two months, a quarter, etc. regardless of the price of the shares at the time of investment. This periodic investment is to be continued over a fairly long period to cover a complete cycle of share price movements.

If the plan is implemented over a complete cycle of stock prices, the investor will obtain his shares at a lower average cost per share than the average price prevailing in the market over the period. This occurs because more shares would be purchased at lower prices than at higher prices.

The dollar cost averaging is really a technique of building up a portfolio over a period of time. The plan does not envisage withdrawal of funds from the portfolio in between. When a large portfolio has been built up over a complete cycle of share price movements, the investor may switch over to one of the other formula plans for its subsequent revision. The dollar cost averaging is specially suited to investors who have periodic sums to invest.

All formula plans have their limitations. By their very nature they are inflexible. Further, these plans do not indicate which securities from the portfolio are to be sold and which securities are to be bought to be included in the portfolio. Only active portfolio revision can provide answers to these questions.

**PORTFOLIO EVALUATION:**

Portfolio evaluation is the last step in the process of portfolio management. It is the stage when we examine to what extent the objective has been achieved. It is basically the study of the impact of investment decisions. Without portfolio evaluation, portfolio management would be incomplete. It has evolved as an important aspect of portfolio management over the last two decades.

**Need for evaluation:**

Investment may be carried out by individuals on their own. The funds available with individual investors may not be large enough to create a well diversified portfolio of securities. Moreover, the time, skill and other resources at the disposal of individual investors may not be sufficient to manage the portfolio professionally. Institutional investors such as mutual funds and investment companies are better
equipped to create and manage well diversified portfolios in a professional fashion. Hence, small investors may prefer to entrust their funds with mutual funds or investment companies to avail the benefits of their professional services and thereby achieve maximum return with minimum risk and effort.

Evaluation is an appraisal of performance. Whether the investment activity is carried out by individual investors themselves or through mutual funds and investment companies, different situations arise where evaluation of performance becomes imperative. These situations are discussed below:

**Self Evaluation:**

Where individual investors undertake the investment activity on their own, the investment decisions are taken by them. They construct and manage their own portfolio of securities. In such a situation, an investor would like to evaluate the performance of his portfolio in order to identify the mistakes committed by him. This self evaluation will enable him to improve his skills and achieve better performance in future.

**Evaluation of portfolio managers:**

A mutual fund or investment company usually creates different portfolios with different objectives aimed at different sets of investors. Each such portfolio may be entrusted to different professional portfolio managers who are responsible for the investment decisions regarding the portfolio entrusted to each of them. In such a situation, the organisation would like to evaluate the performance of each portfolio so as to compare the performance of different portfolio managers.

**Evaluation of mutual funds:**

In India, at present, there are many mutual funds as also investment companies operating both in the public sector as well as in the private sector. These compete with each other for mobilising the investment funds with individual investors and other organisations by offering attractive returns, minimum risk, high safety and prompt liquidity. Investors and organisations desirous of placing their funds with these mutual funds would like to know the comparative performance of
each so as to select the best mutual fund or investment company. For this, evaluation of the performance of mutual funds and their portfolios becomes necessary.

**Evaluation Perspective:**

A portfolio comprises several individual securities. In the building up of the portfolio several transactions of purchase and sale of securities take place. Thus, several transactions in several securities are needed to create and revise a portfolio of securities. Hence, the evaluation may be carried out from different perspectives or viewpoints such a transactions view, security view or portfolio view.

**Transaction view:**

An investor may attempt to evaluate every transaction of purchase and sale of securities. Whenever a security is bought or sold, the transaction is evaluated as regards its correctness and profitability.

**Security view:**

Each security included in the portfolio has been purchased at a particular price. At the end of the holding period, the market price of the security may be higher or lower than its cost price or purchase price. Further, during the holding period, interest or dividend might have been received in respect of the security. Thus, it may be possible to evaluate the profitability of holding each security separately. This is evaluation from the security viewpoint.

**Portfolio view:**

A portfolio is not a simple aggregation of a random group of securities. It is a combination of carefully selected securities, combined in a specific way so as to reduce the risk of investment to the minimum. An investor may attempt to evaluate the performance of the portfolio as a whole without examining the performance of individual securities within the portfolio. This is evaluation from the portfolio view.

Though evaluation may be attempted at the transaction level, or the security level, such evaluations would be incomplete, inadequate and often misleading. Investment is an activity involving risk. Proper evaluation of the investment activity
must, therefore, consider return along with risk involved. But risk is best defined at the portfolio level and not at the security level or transaction level. Hence, the best perspective for evaluation is the portfolio view.

**Meaning of Portfolio Evaluation:**

Portfolio evaluation refers to the evaluation of the performance of the portfolio. It is essentially the process of comparing the return earned on a portfolio with the return earned on one or more other portfolios or on a benchmark portfolio. Portfolio evaluation essentially comprises two functions, performance measurement and performance evaluation. Performance measurement is an accounting function which measures the return earned on a portfolio during the holding period or investment period. Performance evaluation, on the other hand, addresses such issues as whether the performance was superior or inferior, whether the performance was due to skill or luck, etc.

While evaluating the performance of a portfolio, the return earned on the portfolio has to be evaluated in the context of the risk associated with that portfolio. One approach would be to group portfolios into equivalent risk classes and then compare returns of portfolios within each risk category. An alternative approach would be to specifically adjust the return for the riskiness of the portfolio by developing risk adjusted return measures and use these for evaluating portfolios across differing risk levels.

**Measuring Portfolio Return:**

The first step in portfolio evaluation is calculation of the rate of return earned over the holding period. Return may be defined to include changes in the value of the portfolio over the holding period plus any income earned over the period. However, in the case of mutual funds, during the holding period, cash inflows into the fund and cash withdrawals from the fund may occur. The unit-value method may be used to calculate return in this case.

The one period rate of return, $r$, for a mutual fund may then be defined as the change in the per unit net asset value ($NAV$), plus its per unit cash disbursements ($D$)
and per unit capital gains disbursements \((C)\) such as bonus shares. It may be calculated as:

\[
R_p = \frac{(NAV_t - NAV_{t-1}) + D_t + C_t}{NAV_{t-1}}
\]

Where

\(NAV_t\) = NAV per unit at the end of the holding period.

\(NAV_{t-1}\) = NAV per unit at the beginning of the holding period.

\(D_t\) = Cash disbursements per unit during the holding period.

\(C_t\) = Capital gains disbursements per unit during the holding period.

This formula gives the holding period yield or rate of return earned on a portfolio. This may be expressed as a percentage.

The rate of return earned by different mutual funds or mutual fund schemes may be calculated and compared with the rate of return earned by a representative stock market index which can be used as a benchmark for comparative evaluation. The mutual funds may also be ranked in descending order of their rates of return. But such straight forward rates of return comparison may be incomplete and sometimes even misleading. The differential return earned by mutual funds could be due entirely to the differential risk exposure of the funds. Hence, the returns have to be adjusted for risk before making any comparison.

**Risk adjusted Returns:**

One obvious method of adjusting for risk is to look at the reward per unit of risk. We know that investment in shares is risky. Risk free rate of interest is the return that an investor can earn on a riskless security, i.e. without bearing any risk. The return earned over and above the risk free rate is the risk premium that is the reward for bearing risk. If this risk premium is divided by a measure of risk, we get the risk premium per unit of risk. Thus, the reward per unit of risk for different portfolios or mutual funds may be calculated and the funds may be ranked in descending order of the ratio. A higher ratio indicates better performance.
Two methods of measuring the reward per unit of risk have been proposed by William Sharpe and Jack Treynor respectively in their pioneering work on evaluation of portfolio performance.

Sharpe Ratio:

The performance measure developed by William Sharpe is referred to as the Sharpe ratio or the reward to variability ratio. It is the ratio of the reward or risk premium to the variability of return or risk as measured by the standard deviation of return. The formula for calculating Sharpe ratio may be stated as:

\[ \text{Sharpe ratio (SR)} = \frac{r_p - r_f}{\sigma_p} \]

Where

\( r_p \) = Realised return on the portfolio.
\( r_f \) = Risk free rate of return.
\( \sigma_p \) = Standard deviation of portfolio return.

Treynor Ratio:

The performance measure developed by Jack Treynor is referred to as Treynor ratio or reward to volatility ratio. It is the ratio of the reward or risk premium to the volatility of return as measured by the portfolio beta. The formula for calculating Treynor ratio may be stated as:

\[ \text{Treynor ratio (TR)} = \frac{r_p - r_f}{\beta_p} \]

Where

\( r_p \) = Realised return on the portfolio.
\( r_f \) = Risk free rate of return.
\( \beta_p \) = Portfolio beta.

Example:

The return and risk figures of two mutual funds and the stock market index are given in the table below:

<table>
<thead>
<tr>
<th>Fund</th>
<th>Return (per cent)</th>
<th>Standard deviation (per cent)</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>( A )</td>
<td>12</td>
<td>18</td>
<td>0.7</td>
</tr>
<tr>
<td>( Z )</td>
<td>19</td>
<td>25</td>
<td>1.3</td>
</tr>
<tr>
<td>( M ) (Market index)</td>
<td>15</td>
<td>20</td>
<td>1.0</td>
</tr>
</tbody>
</table>
The risk free rate of return is 7 per cent. The Sharpe ratios for the three funds are:

\[
A = \frac{12 - 7}{18} = 0.277 \\
Z = \frac{19 - 7}{25} = 0.48 \\
M = \frac{15 - 7}{20} = 0.40
\]

As per Sharpe’s performance measure, fund Z has performed better than the benchmark market index, while fund A has performed worse than the market index. The Treynor ratios for the three funds are:

\[
A = \frac{12 - 7}{0.7} = 7.14 \\
Z = \frac{19 - 7}{1.3} = 9.23 \\
M = \frac{15 - 7}{1.0} = 8.00
\]

According to Treynor’s performance measure also, fund Z has performed better and fund A has performed worse than the benchmark.

Both the ratios are relative measures of performance because they relate the return to the risk involved. However, they differ in the measure of risk used for the purpose. Sharpe uses the total risk as measured by standard deviation, while Treynor employs the systematic risk as measured by the beta coefficient. In a fully diversified portfolio, all unsystematic risk would be diversified away and the relevant measure of risk would be the beta coefficient. For such a portfolio, Treynor ratio would be the appropriate measure of performance evaluation. For a portfolio that is not so well diversified, the Sharpe ratio using the total risk measure would be the appropriate performance measure.

**Differential Return:**

Another type of risk adjusted performance measure has been developed by Michael Jensen and is referred to as the Jensen measure or ratio. This ratio attempts to measure the differential between the actual return earned on a portfolio and the return expected from the portfolio given its level of risk.
The CAPM model is used to calculate the expected return on a portfolio. It indicates the return that a portfolio should earn for its given level of risk. The difference between the return actually earned on a portfolio and the return expected from the portfolio is a measure of the excess return or differential return that has been earned over and above what is mandated for its level of systematic risk. The differential return gives an indication of the portfolio manager’s predictive ability or managerial skills.

Using the CAPM model, the expected return of the portfolio can be calculated as follows:

$$E(R_p) = R_f + \beta_p (R_m - R_f)$$

Where
- $E(R_p)$ = Expected portfolio return.
- $R_f$ = Risk free rate.
- $R_m$ = Return on market index.
- $\beta_p$ = Systematic risk of the portfolio.

The differential return is calculated as follows:

$$\alpha_p = R_p - E(R_p)$$

Where
- $\alpha_p$ = Differential return earned.
- $R_p$ = Actual return earned on the portfolio.
- $E(R_p)$ = Expected return.

Thus, $\alpha_p$ represents the difference between actual return and expected return. If $\alpha_p$ has a positive value, it indicates that superior return has been earned due to superior management skills. When $\alpha_p$, it indicates neutral performance. It means that the portfolio manager has done just as well as an unmanaged randomly selected portfolio with a buy and hold strategy. A negative value of $\alpha_p$ indicates that the portfolio’s performance has been worse than that of the market or a randomly selected portfolio of equivalent risk.

The alpha value in Jensen measure can be tested for its degree of significance from a value of zero by statistical methods. This means, an analyst can determine
whether the differential return could have occurred by chance or whether it is significantly different from zero in a statistical sense.

Let us consider funds A and Z. The actual returns realised from the two funds are 12 per cent and 19 per cent respectively with beta coefficients being 0.7 and 1.3 respectively. The market return is 15 per cent and the risk free rate is 7 per cent. The expected return on the two funds can be calculated as shown below:

Fund A: $E(R_p) = 7 + 0.7(15 - 7) = 12.6$
Fund Z: $E(R_p) = 7 + 1.3(15 - 7) = 17.4$

The differential return or alpha value is shown below:

Fund A: $\alpha_p = 12 - 12.6 = -0.6$
Fund Z: $\alpha_p = 19 - 17.4 = 1.6$

The negative value of alpha for fund A indicates that its performance has been inferior. The positive value of alpha for fund Z indicates that its performance has been superior, presumably due to the superior management skills of its portfolio managers.

**Decomposition of Performance:**

The performance measures access the overall performance of a portfolio or fund. Eugene Fama has provided an analytical framework that allows a detailed breakdown of a fund’s performance into the source or components of performance. This is known as the Fama decomposition of total return.

The total return on a portfolio can be firstly divided into two components, namely risk free return and the excess return. Thus,

$$\text{Total risk} = \text{Risk free return} + \text{Excess return}$$

The excess return arises from different factors or sources, such as risk bearing and stock selection. Hence the excess return, in turn, may be decomposed into two components, namely risk premium or reward for bearing risk and return from stock selection known as return from stock selectivity. Thus,
Excess return = Risk premium + Return from stock selection

The risk of a security is of two types: systematic risk and unsystematic risk or diversifiable risk. When a portfolio of securities is created, most of the unsystematic risk or diversifiable risk would disappear. But, in practice, no portfolio would be fully diversified. Hence, a portfolio would have both systematic risk and a small amount of diversifiable risk. Hence, the risk premium can be decomposed into two components, namely return for bearing systematic risk (market risk) and return for bearing diversifiable risk. Thus,

Risk premium = Return for bearing systematic risk + Return for bearing diversifiable risk

Thus, the total return on a portfolio can be decomposed into four components:

Return on portfolio = Riskfree rate + Return from market risk
+ Return from diversified risk
+ Return from pure selectivity

This may be expressed as:

\[ R_p = R_f + R_1 + R_2 + R_3 \]

Each component can be calculated. The risk free rate of return \( (R_f) \) is the return available on a riskless asset such as the government security.

The return from market risk \( (R_1) \) is calculated as:

\[ R_i = \beta_p (R_m - R_f) \]

Where

\( R_m \) = Return on the market index.

The return from diversifiable risk \( (R_2) \) is calculated as:

\[ R_2 = \left[ \left( \frac{\sigma_p}{\sigma_m} \right) - \beta_p \right] (R_m - R_f) \]

Where

\( \sigma_p \) = Portfolio standard deviation.

\( \sigma_m \) = Standard deviation of the market index.
The return from pure selectivity \((R_3)\) can be obtained as the difference between the actual return and the sum of the other three components as:

\[ R_3 = R_p - (R_f + R_1 + R_2) \]

The return from pure selectivity is really the additional return obtained by a portfolio manager for his superior stock selection ability. It is the return earned over and above the return mandated by the total risk of the portfolio as measured by standard deviation. Mathematically, this can be calculated as the difference between the actual return on a portfolio and the return mandated by its total risk. This is also known as Fama’s net selectivity measure. This can be calculated by the following formula:

\[
\text{Fama’s net selectivity} = R_p - \left[ R_f + \left( \frac{\sigma_p}{\sigma_m} \right) - \left( \frac{R_m}{R_f} \right) \right]
\]

Where

- \( R_p = \) Actual return on portfolio.
- \( R_f = \) Risk free rate.
- \( R_m = \) Return on market index.
- \( \sigma_p = \) Standard deviation of portfolio return.
- \( \frac{\sigma_p}{\sigma_m} = \) Standard deviation of market index return.

The return from net selectivity may be negative. This occurs when the actual return realised on a portfolio is less than that mandated by the total risk of the portfolio. This indicates that, due to poor stock selection, the portfolio has not earned the return expected from it commensurate with its total risk.

The decomposition of total return is useful in identifying the different skills involved in active portfolio management. A portfolio manager who attempts to earn a higher return than the market return assumes higher risk and depends on his superior stock selection ability to achieve the higher return. If he is successful, the return due to pure selectivity would be positive.

Portfolio evaluation completes the cycle of activities comprising portfolio management. It provides a mechanism for identifying weaknesses in the investment process and for improving the deficient areas. Thus, portfolio evaluation would serve as a feedback mechanism for improving the portfolio management process.