UNIT 14 PERFORMANCE EVALUATION OF MANAGED PORTFOLIO

Objectives

The objectives of this Unit are to:

- discuss the various concepts and methods of computing portfolio return viz.
- distinguish between Performance Measurement and Performance Evaluation and the primary components of performance.
- highlight the concept of benchmark portfolio for comparison and evaluation.
- explain why a portfolio earned a certain return over a particular time period, also known as performance attribution; and
- pinpoint the problems encountered in performance evaluation.

Structure

14.1 INTRODUCTION

Quite frequently small investors feel insecure in managing their own investment in securities because they consider themselves inadequate to perform this delicate task successfully. Often, they feel that they lack education, background, time, foresight, resources and the temperament to carry out the proper handling of their portfolio. The logical step they then take is to turn the job over to a professional portfolio manager. Most often, the portfolio manager chosen takes the form of a mutual fund or Investment Company. The main reasons for selecting a mutual fund or investment company involves the management, diversification and liquidity aspects. Managers trained in the techniques of security analysis devote their full time for meeting the funds' investment objectives. This permits a constant monitoring of the securities comprising the portfolio. Furthermore, large amounts of money entrusted to the fund is invested in securities of different industries and thereby enabling diversification which otherwise is not possible for an average investor with limited funds. This diversification evolves as a result of stated objectives of the Fund. Further, these institutions are also able to obtain lower brokerage commissions than that of an individual small investor. The small investors opt for a fund whose objectives are mostly in line with his/her own. Since many funds with various objectives are competing to acquire the funds of investors, it is necessary to evaluate the performance of the fund managers.

Though historical performance is not an indicator for future performance, it given a fir understanding on how the fund manager performs in different market. For instance, some fund managers perform better than others when the market was in uptrend whereas some others focus on reducing volatility and they show better performance when the market was not doing well.

This Unit discusses various methods of computing portfolio returns and components of investment performance. And pinpoint the difficulties in risk-adjusted measures of portfolio performance. Further, we shall also explain the concept and method of construction of benchmark portfolio for performance evaluation of a managed portfolio. Let us begin by distinguishing performance measurement and performance evaluation and explaining methods of computing portfolio return.

14.2 METHODS OF COMPUTING PORTFOLIO RETURN

Performance measurement is just an accounting function, which attempts to reconcile the end of period with the beginning period values. Performance evaluation on the other hand, addresses the issues of whether:

- The past performance was superior or inferior
- Such performance was due to skill or luck
- Future performance will be similar or not.

Portfolio performance is generally evaluated over a time interval of at least four years, with returns for a number of sub-periods within the interval-like monthly or quarterly, so that there is a fairly adequate number of observations for statistical evaluation. The calculation of portfolio return is fairly simple when there are no deposits or withdrawals of money from a portfolio during a time period. In that case, the market value of the portfolio in the beginning and at the end of the period are determined for computing the portfolio return. The three steps involved in the computation of the return are illustrated in Table 14.1.

Table 14.1 Measuring Portfolio Return

Step 1: Portfolio Value - Beginning

Shares	No. of Shares	Market Price	Portfolio Value Beginning
A	50	100	5,000
B	100	70	7,000
C	200	40	8,000
D	500	60	30,000
Total (V_0)			**50,000**

Step 2: Portfolio Value - Ending

Shares	No. of Shares	Market Price	Portfolio Value Beginning
EA	50	200	10,000
FB	100	40	4,000
GC	200	110	22,000
HD	500	80	40,000
Total (V_1)			**76,000**

Step 3:

Portfolio Return $= (V_1 - V_0) / V_0$

$= (76,000 - 50,000) / 50,000$

$= 52\%$

Performance measurement becomes difficult when a client adds or withdrawals money from the portfolio. The per cent change in the market value of the portfolio as computed above may not be an accurate measurement of the portfolio's return in that case. For example, if the beginning value of the portfolio is Rs.50,000 and the value at the end of October is Rs.70,000 and the client deposits Rs.30,000 in cash in early November, the value at the end of the year would be Rs.1,00,000. The portfolio return in this case will be

$$\frac{1,00,000 - 50,000}{50,000} = 100\%$$

However, the entire return was not due to the investment manager. A more accurate measure would be:

$$\frac{(1,00,000 - 50,000) - 50,000}{50,000} = 40\%$$

14.2.1 Dollar or Value-Weighted Rate of Return

It is also called as the internal rate of return. The interest rate that equates the initial contribution and the cash flows that occur during the period with the ending value of the fund is the dollar-weighted rate of return. Mathematically, this measure of return is the dollar-weighted average of sub-period returns with the dollar weights equal to the sum of the initial contribution and all the cash flows upto the time of the sub-period return. Note, we don't need to make any adjustment for Rupee investment since the dollar actually means value.

For example, a portfolio has market value of Rs. 100 lakhs. In the middle of the quarter, the client deposits Rs.5 lakhs and at the end of the quarter the value of the portfolio is Rs. 103 lakhs. The dollar-weighted return would be calculated by solving the following equation for r.

$$100 = \frac{-5}{(1 + r)} + \frac{103}{(1 + r)^2}$$

r = - .98% which is a semi-quarterly rate of return.

This can be converted into quarterly return with the help of the following equation.

$[1 + (- 0.0098)]^2 - 1 = -1.95$ % per quarter

14.2.2 Time-Weighted Rate of Return

The time-weighted rate of return is the weighted average of the internal rates of return for the sub-periods between the cash flows and it is weighted by the length of the sub-periods. In other words, the geometric (compounded) return measured on the basis of periodic market valuations of assets is time-weighted return. The equation for time-weighted rate of return for 4 sub-periods is

Annual Return = $[(1 + r_1)(1+r_2)(1+r_3)(1+r_4)]^{1/4} - 1$

Let us now make a quick comparison of Dollar-Weighted and Time-Weighted Returns. A portfolio of Rs. 50 lakhs declines to Rs. 25 lakhs in the middle of the quarter at which point, the client deposits Rs. 25 lakhs with the portfolio management firm. Note before the investment of additional investment, the investor lost 50% of the return. At the end of the quarter, the portfolio has a market value of Rs. 100 lakhs. Now the investor during the second period has gained 100% return. The semi-quarterly dollar-weighted return for this port-folio would be:

$$50 = \frac{-25}{(1 + r)} + \frac{100}{(1 + r)^2}$$

r = 18.6 %

Quarterly dollar-weighted return = $(1.186)^2 - 1 = 40.66$ %. However, its quarterly time-weighted return would be $[(1 - 0.5)(1 + 1)]^{1/2} - 1 = 0$ per cent. There is a lot of difference in

returns. Each rupee lost half its value in the first half and the remaining half doubled in value in the second half. Thus assuming that a rupee at the beginning was worth a rupee at the end of the quarter, a time-weighted return is a more accurate measure than the dollar-weighted return. A dollar-weighted return is strongly influenced by the size and the timing of the cash flows (that is deposits or withdrawals) over which the investment manager has no control.

If the return in the first, second, their and fourth quarters are given by r_1, r_2 r_3 and r_4, annual return can be calculated by adding 1 to each quarterly return, then multiplying the four figures, taking the n^{th} route of the product and finally subtracting 1 from the resulting product. Thus,

$$\text{Annual Return} = [(1 + r_1)(1 + r_2)(1 + r_3)(1 + r_4)]^{1/4} - 1$$

This method assumes the reinvestment of both the capital and the earnings at the end of each quarter.

The performance of a mutual fund can be evaluated by using the beginning and the end period net asset values as follows:

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

The one period rate of return for a mutual fund (R_p) is defined as the change in net asset value (NAV) plus its cash disbursement (D) and capital gains disbursements (C). Net asset values of the fund are adjusted for bonus and rights. Table 14.2 (given at the end of this Unit) shows the rate of return earned by selected mutual funds during the last few years. The return on BSE Sensex is also given in the Table to provide a benchmark for performance evaluation. The funds are ranked in the order of performance. The differential return earned could have been due to differential risk exposures of the funds. Hence, the returns have to be adjusted for risk before making any comparison. Risk-adjusted return gives an idea of whether the return earned is commensurate with the risk incurred.

Activity 1

1. Between performance measurement and performance evaluation, which one is just an accounting function?

   ……
   ……
   ……
   …….

2. Between Dollar-Weighted Return and Time-Weighted Return, which method considers the market value of the portfolio just before each cash flow occurs?

   ……
   ……
   ……
   ……

3. In order to evaluate the performance of a mutual fund besides the beginning there d periods net asset values, which other financial variables are relevant?

   ……
   ……
   ……
   ……

14.2.3 Risk Adjusted Rate of Returns

It is a measure of how much risk a fund or portfolio assumed to earn its returns. This is usually expressed as a number or a rating. The performance of a fund should be assessed in terms of return per unit of risk. The more return per unit of risk, the better. The funds that provide the highest return per unit of risk would be considered the best performer. For well-diversified portfolios in all asset categories, the standard deviation is the relevant measure of risk. When evaluating individual stocks and not so well diversified portfolios, the relevant measure of risk is the systematic or market risk, which can be assessed using the beta co-efficient (β). Beta, as you would recall from Unit 12, signifies the relationship between covariance (stock, market) and variance of market. ***Two well-known measures of risk adjusted return are used for the purpose, one is the Sharpe ratio and the other is the Treynor ratio.***

Sharpe Ratio

Sharpe ratio is the ratio developed by Bill Sharpe and is calculated by subtracting the risk free rate from the rate of return for a portfolio and dividing it by the standard deviation of the portfolio returns. It tells us whether the returns of the portfolio were because of smart investment decisions or by excess risk.

Sharpe ratio = (Portfolio return - risk free return) / Portfolio Standard Deviation

Or

$$[r_p - r_f] / \sigma_p$$

i.e., realized return on the portfolio (r_p) in excess of risk- free rate (r_f) divided by the standard deviation of the portfolio (σ_p).

For example, let's assume that we look at a one-year period of time where an index fund returned 11% and Treasury bills earned 6%. If the standard deviation of the index fund was 20%, then the Sharpe Ratio is computed as follows:

Sharpe ratio = [11- 6] / 0.20 = 25

The Sharpe ratio is an appropriate measure of performance for an overall portfolio . particularly when it is compared to another portfolio or another index such as BSE Sensex, BSE 100, NSE-50, etc.

Treynor Ratio (Reward to Variability ratio)

Treynor Ratio measures the returns earned in excess of those that could have been earned on a riskless investment, per unit of market risk assumed. This ratio is similar to Sharpe Ratio except it uses beta instead of standard deviation. It is the ratio of a fund's average excess return to the fund's beta.

T = Return of Portfolio - Return of Risk Free Investment / Beta of Portfolio

Or

$$[r_p - r_f] / \beta_p$$

i.e. realised portfolio return (r_p) in excess of risk-free rate (r_f) divided by the beta of the portfolio (β_p).

The absolute risk adjusted return is the Treynor ratio + the risk free rate.

For instance, assume two portfolios A and B. The respective returns are 12% and 14% with a beta of 0.7 and 1.2 respectively. If the Risk Free Rate = 9%, then the Treynor's ratio is computed as follows:

T(A)=[12-9] / 0.7 = 4.25

Risk adjusted rate of return of Portfolio A = 4.25 + 9 = 13.25%

T(B)=[14-9]/ 1.2 = 4.17

Risk adjusted rate of return of Portfolio B =4.17 + 9 = 13.17%

Without any analysis of risk, if you ask any investor what is the better number (12% or 14%) almost universally they might say 14%.. However, when you point out the risk-adjusted rate of return, many adjust their thinking.

Both these measures provide a way of ranking the relative performance of various portfolios on a risk-adjusted basis. For investors whose portfolio is a predominant representation in a particular asset class, the total variability of return as measured by standard deviation is the relevant risk measure.

The calculation of Sharpe and Treynor ratios for two hypothetical Funds are given below:

Fund	Return	Risk-Return	Excess Return	SD	Beta	Sharpe Ratio	Treynor Ratio
1	20	10	10	8	0.80	L25	12.50
2	30	10	20	15	1.10	1.33	18.18

The ranking on both these measures will be identical when both the funds are well diversified. A poorly diversified fund will rank lower according to the Sharpe measure than the Treynor ratio. The less diversified fund will have greater risk when using standard deviation is used.

Differential Return (Jensen Measure)

Jensen's measure is an absolute measure of performance, adjusted for risk. This measure assesses the portfolio manager's predictive ability. The objective is to calculate the return that should be expected for the fund, given the risk level and comparing it with the actual return realised over the period.

The model used is;

$$R_{jt} - R_{ft} = a_i + \beta_j(R_{mt} - R_{ft}) + e$$

The variables are expressed in terms of return and risk.

R_{jt} = Average return on portfolio for period t

R_{ft} = Risk-free rate of interest for period t

a_i = Intercept that measures the forecasting ability of the portfolio manager

β_j = A measure of systematic risk

R_{mt} = Average return on the market portfolio

e = Error term

In both Sharpe and Treynor models, it is assumed that the intercept is at the origin. In the Jensen model, the intercept can be at any point, including the origin.

If the intercept is a_l and has a positive value, it indicates that the superior return has been earned due to superior management skills. On the other hand if the intercept is zero, it indicates neutral performance. This manager has done as well as an unmanaged randomly selected portfolio with a buy-and-hold strategy. If the intercept is negative, then the managed portfolio did not do as well as an unmanaged portfolio of equal systematic risk.

Jensen's measure is illustrated below:

Actual Returns and Risk				
	R_{ft}	R_{it}	R_{mt}	Beta
Fund A	5	12	15	0.50
Fund B	5	20	15	1.50
Fund C	5.	14	15	1.10

From Jensen's equation, the return on the portfolio (assuming c = 0 and the intercept (a_i) is at the origin) is :

$$R_{jt} = R_{ft} + \beta_j (R_{mt} - R_{ft})$$

Fund A

$$R_{jt} = 5 + 0.5 (15 - 5) = 10$$

a = 12 - 10 = 2% (Excess Positive Return)

Fund B

= 5 + 1.5 (1 5 - 5) = 20

a = 20 - 20 = 0% (Neutral Performance).

Fund C

= 5 + 1.10 (1 5 - 5) = 16

a = 14 - 16 = - 2% (Negative Return)

Jensen measure not only calculates the differential between actual and expected earnings, but also enables an analyst to determine whether the differential return could have occurred by chance or whether it is significantly different from zero in a statistical sense. The (alpha value) value of the equation can be tested to see if it is significantly different from zero by using a `t statistic'. When the (alpha value) value is high and the error in the regression is low, the statistic will be high.

A low (alpha value) value and high regression error results in low t-statistic. At-statistic of 2 is significant in a statistical sense. It implies that the probability of the performance due to chance is very low. A t-statistic of - 1 indicates that the performance occurred due to chance.

The R^2 for regression of the fund returns with the market returns indicates the degree of diversification of the fund. Higher the R^2, the more the fund is correlated with the market index; and less the unsystematic risk, the better diversified is the fund.

Activity 2

Fund		January 98 - July 2001		
	Return	Beta	SD	R^2
Scheme X	39.90	0.81	7.30	96%
Scheme Y	32.70	0.91	930	78%

Between Scheme X and Scheme Y, which one is more diversified? Which one is having greater unsystematic risk in the portfolio?

14.3 COMPONENTS OF INVESTMENT PERFORMANCE

Portfolio Managers need a clear and relevant method of attributing returns to various activities that comprises the investment management process viz. *investment policy or risk taking, market timing and stock selection.*

14.3.1 Stock Selection

The most important decision as part of investment strategy is asset allocation. This involves deciding about what percentage of the portfolio should be in stocks, bonds, cash, etc., based on the goals and funds available with the portfolio manager, and also taking in view

the current and anticipated market conditions? Once he makes that decision, he has to select suitable investments within the selected asset classes.

For that portion of the portfolio that the portfolio manager allocates to equities (or if the fund is equity based fund), he should strive to buy shares in excellent businesses at prices that make business sense. Search for opportunities that offer the highest predictable annual compounding rate of return possible, where the risk is reasonable in light of the potential reward.

Further, he should make long-term investments in the common stock of great businesses at prices that make economic sense given the business's intrinsic value. The intrinsic value of an investment is the projected annual compounding rate of return the investment will produce. Focus on the predictability of future earnings of a business in order to project future value, and make long-term investments in businesses whose future earnings are predictable to a satisfactory degree of certainty. Moreover he should make only those investments where he is able to do so at fair or bargain prices. The price he pays determines the rate of return.

Various methods have been developed to decompose total portfolio returns and attribute it to each component. Eugene Fama has provided a framework for performance attribution. We will use one example to show how this decomposition is feasible.

Example: A mutual fund scheme has offered a return of 15% during a period when the market index (like Sensex or Nifty) reported a return of 8%. The risk-free rate during the period was 6%. The standard deviation of returns of the market index and the portfolio are 12% and 10% respectively. The beta of the portfolio is 0.75. The scheme has reported an excess return of 9% (15% - 6%) over and above the risk-free return and we need to find out the sources of such excess returns with the help of the information given.

Since the beta of the stock is 0.75, the expected return of the fund as per CAPM is

$$E(R) = R_f + \text{beta}\ (R_m - R_f) = 6\% + 0.75\ (8\% - 6\%) = 7.5\%$$

Against this expected return 7.5%, the fund has offered a return of 15%. The difference of 7.50% can be attributed to selectivity or ability of the fund managers in selecting the stocks. The balance 1.5% represents the premium for risk.

14.3.2 Risk Taking

To earn excess return, portfolio managers bear additional risk. By using the Capital Market Line (CML) we can determine the return commensurate with risk as measured by the standard deviation of return. The normal return for Fund A, using total risk would be:

$$R_f + [(R_m - Rr_f)\ (\sigma_p / \sigma_m)]$$

i.e. 6%+[(8% - 6%) (10% / 12%)] = 7.67%

The difference between this normal return of 7.67% and the expected normal return computed earlier (7.50%) is 0.17. This additional expected return is on account of diversification risk.

The fund offered a return of 15% against the expected return of 7.50% and the excess return is attributed to selectivity. However, selectivity increases diversification risk, which was quantified as 0.17%. If we remove the compensation required for bearing diversification risk, the net return attributed to selectivity is 7.33%

The overall performance of a Fund can be thus decomposed into (i) due to selectivity and (ii) due to risk taking.

14.3.3 Market Timing

Portfolio Managers can also achieve superior performance by picking up high beta stocks during a market upswing and moving out of equities and into cash in declining markets. To study market timing ability, one could calculate the quarterly returns for a Fund and for the market index like Bombay Stock Exchange's National Index of a 5 year period and plot them on a scatter diagram. Then a characteristic line can be fitted.

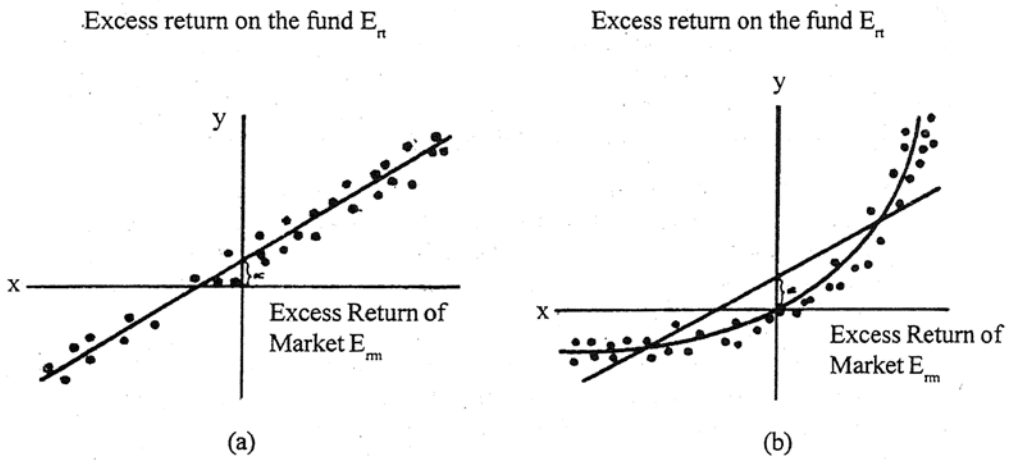

Fig. 14.2 (a, b) : Fund return vs. market return for (a) superior stock selection and (b) superior market timing. [Source: J.L. Treynor and K. Mazuy, Can Mutual Funds outguess the Market?" Harvard Business Review (July-August 1966), pp. 131-136.].

Figures 14.2 (a) and 14.2(b) give the excess return of the fund on the Y-axis and the excess return of the market index on the X-axis. Both figures reveal positive ex-post alphas. The scatter diagram in Figure 14.2(a) shows that all the point cluster close to the regression line indicating that the relationship between portfolio excess return and market excess return is linear. The average beta of the portfolio is fairly constant or the beta of the portfolio was roughly the same at all times. Since alpha is positive, it appears that the excess return is due to his stock selection abilities.

In Figure 14.2(b), the points in the middle lie below the regression line and those at the ends lie above the regression line. This suggests that the portfolio consisted of high beta securities when market return was high and low beta securities when the market return was low.

To describe this relationship, we can fit a curve to the points plotted by adding a quadratic term to the simple linear relationship.

$r_p = a + b_{rm} + cr^2_m$, where

r^2_m = return on the market index squared

r_P = return on the fund (portfolio),

a, b, c = values to be estimated by regression analysis.

The Figure indicates that the curve becomes steeper as one moves to the right of the diagram. The Fund movements are amplified on the upside and *vice versa. This* implies that the Fund manager was anticipating market changes correctly and that the superior performance of the Fund manager was anticipating market changes correctly and that the superior performance of the fund can be attributed to skill in timing.

The performance of 37 mutual funds was studied by Jack L. Treynor and Kay Mazuy over the period 1953 through 1962. Only one of the funds had a fitted quadratic term that was significantly different from zero, indicating market-timing skills. The fitted relationships for other funds evidenced no curvilinearity, indicating that the funds did not demonstrate any 'skills in market timing. This entire period was one of rising market.

James Farrel covered market prices in both rising and falling markets (1957-1975) and came to the conclusion that Funds as a group do not make substantial shifts in asset positioning to take advantage of market timing.

14.4 PROBLEMS WITH RISK-ADJUSTED MEASURES

In 1997, Modigliani and Modigliani developed the risk-adjusted performance measure (RAP) often called M-squared, which is by now widely accepted in theory and practice. Two-years later Lobosco showed that Modigliani's measure can be combined with

Sharpe style analysis to take investment style into consideration. Both the measures have increased the investor awareness of risk adjusted performance measures. However these measures use the standard deviation as the measure of risk and hence it is relevant only for investors who invest the whole of their savings into the fund. It is pertinent to note here the other problems of using the risk-adjusted performance measures.

- **Use of Market Surrogate.** All measures other than reward to variability ratio (Treynor ratio) requires the identification of a market portfolio. Whatever Surrogate is used for market portfolio (say a market index like the ET Index) it can be criticised as being inadequate. By making slight changes in the surrogate, performance ranking can vary.
- **Choice of Risk-Free Rate.** The choice of a risk-free rate has to be appropriate. If the risk-free rate is too low, then the benchmark portfolio based on it may give too high a return, making it difficult for the portfolio to show superior performance against the benchmark.
- **Validity of CAPM**. reward to volatility measure and differential return measure involves beta, using the Capital Asset Pricing Model. But CAPM may not be the correct asset-pricing model in all circumstances. Other asset pricing models are being developed where the risk would incorporate many other factors apart from market related risk.

14.5 BENCHMARK PORTFOLIOS FOR PERFORMANCE EVALUATION

Benchmark portfolio is a tool for the meaningful evaluation of the performance of a portfolio manager. The more the benchmark reflects the manager's stated style, the more accurately the performance of the manager's skill can be assessed. Specialised benchmarks are called `normal portfolios'. They are especially constructed by mutual consent of the client and the manager to reflect the client's needs and the manager's style. Some management firms develop a normal portfolio, which they can use for all clients, and some develop it separately for each type of client.

When benchmarks are designed in advance, the portfolio managers know what the specific objectives are and tailor the portfolio accordingly. The benchmark should reflect the appropriate investment universe in which the manager works. Without a yardstick for proper comparison, it becomes difficult to distinguish between active management skills and random results.

Rather than using a market index like the Bombay Stock Exchange's Sensitive Index or the Economic Times Index, a benchmark portfolio would use a portfolio with predominantly value-oriented shares for a value manager, growth-oriented shares for a growth manager and small capitalization shares for a small-cap (size) manager. It is quite possible for an investment manager to perform better than the benchmark, though the benchmark may itself under-perform in relation to a market index.

The process of constructing a benchmark portfolio involves:

a) Defining the universe of stock to be used for the benchmark portfolio, and

b) Defining the weightage of the stocks in the universe.

An investment manager's month-end portfolio can be examined for the last five years to get an idea of the average exposure of the manager to various factors (industry, capitalisation, P/E etc.). For example, if an investment manager tends to invest in securities in high capitalisation, low PE, low growth stocks, higher weights can be assigned to these in the benchmark. The more stable the exposure and the investment style, the easier it should be to build benchmarks with appropriate weights.

Performance attribution analysis, as mentioned earlier, is a means of evaluating an investment manager's performance, the return and the sources of return relative to a benchmark portfolio. This analysis looks to an investment manager's total 'excess' return, or `Active Management Return' (AMR) relative to its benchmark over the given

period. It also looks at the components of AMR stock selection, industry selection and market timing.

The benchmark portfolio return is a `buy-and-hold' return on a predetermined portfolio tailored to a manager's style. The cumulative excess return or cumulative AMR is the difference between actual portfolio return and the benchmark return over the evaluation period.

14.6 SUMMARY

In this unit we have discussed various concepts and methods of computing portfolio return viz. Dollar-Weighted Return, Value-Weighted Return, and Risk-adjusted Rate of Return. We have also distinguished between performance measurement and performance evaluation and highlighted the primary components of performance namely stock selection and market timing and also the concept and method of construction of a benchmark portfolio for comparison and evaluation with a managed portfolio. The problems faced in using risk-adjusted measures for portfolio evaluation have also been briefly pointed out in this Unit. In the following two units, we shall learn about portfolio management practices in investment companies and mutual funds in India.

14.7 SELF-ASSESSMENT QUESTIONS/EXERCISES

1. Distinguish between performance measurement and performance evaluation of an investment portfolio.

2. Distinguish between Dollar-Weighted and Time-Weighted Return.

3. Describe the Sharpe, Treynor and the Jensen measures of portfolio returns.

4. How are the returns on managed portfolio attributed to stock selection and market timing? Discuss and illustrate.

5. What are benchmark portfolios? How are they used to evaluate the performance of a portfolio manager? Discuss with suitable examples.

14.8 FURTHER READINGS

G.P. Brinson, JJ Diermier and GG Schlarbaum *"A Composite Portfolio Benchmark for Pension Plans"* - Financial Analyst Journal, March/April 1986.

Eugene Fama, *"Components of Investment Performance",* Journal ofFinance, June 1972.

Michael Murphy, *"Why No One Can Tell Who's Winning",* Financial Analysts Journal, May - June 1980.

Jack L Treynor, *"How to Rate Management of Investment Funds",* Harvard Business Review, January - February 1965.

William F Sharpe *"Mutual Fund Performance",* Journal of Business, January 1996.

Table 14.2: Performance of Mutual Funds Schemes as on March 2002

Rank	Scheme Name	3 year	6 mont	1 year
	Sensex	3.91	17.80	-12.14
	Nifty	7.94	17.32	-11.20
1	JM Basic Fund	51.38	132.31	55.15
2	Zurich India Taxsaver - Growth	41.82	43.05	21.59
3	Zurich India Taxsaver - Dividend	41.55	42.64	19.61
4	Alliance Capital Tax Relief 96	35.83	59.39	11.18
5	Pioneer ITI Infotech Fund - Dividend	30.71	100.00	-0.58
6	Alliance Equity Fund - Dividend	24.09	47.19	6.67
7	Zurich India Equity - Dividend	23.70	54.19	27.55
8	Prudential ICICI Growth Plan - Dividend	22.55	41.71	8.48
9	Tata Pure Equity Fund	22.24	31.16	-3.33
10	Templeton India Growth Fund	21.76	41.61	13.83
11	Zurich India Equity - Growth	21.59	54.26	28.06
12	Pioneer ITI Bluechip - Growth	19.23	53.76	9.63
13	Pioneer ITI Prima Plus - Growth	19.10	55.41	21.20
14	Alliance Equity Fund - Growth	17.30	50.39	2.69
15	Pioneer ITI Prima Plus Dividend	15.42	34.72	5.01
16	Pioneer ITI Bluechip - Dividend	15.09	41.48	0.95
17	Pioneer ITI Prima Fund - Growth	14.97	87.52	39.12
18	Reliance Growth - Dividend	14.95	49.21	20.15
19,	Birla Advantage Fund - Dividend	13.59	32.09	3.14
20	Birla Advantage Fund - Growth	13.59	32.09	3.14
21	Reliance Vision	13.46	60.79	30.90
22	Pioneer ITI Infotech Fund - Growth	12.35	100.00	-0.60
23	Prudential ICICI Growth Plan -	12.07	41.36	8.24
24	GIC Growth Plus II	10.97	38.16	-3.53
25	Pioneer ITI Prima Fund - Dividend	10.68	53.32	13.75
26	Sundaram Growth Fund	10.15	42.53	10.03
27	SUN F&C Value - Dividend	9.41	40.83	-0.58
28	Zurich India Top 200 - Dividend	8.26	44.68	14.98
29	Zurich India Top 200 - Growth	7.14	44.53	13.51
30	Reliance Growth - Growth	7.08	49.35	20.21
31	KM K 30 Unit Scheme	6.65	36.63	-3.17
32	UTI Primary Equity Fund	6.16	33.37	11.92
33	Chola a Freedom Technology - Dividend	4.92	40.00	0.33
34	GIC Fortune 94	2.97	66.24	22.20
35	DSP ML Equity Fund	1.91	35.00	,7.81
36	UTI Grandmaster - 1993	1.17	35.77	20.01
37	UTI Mastergain 92	0.29	38.97	-0.10
38	Zurich India Capital Builder - Dividend	0.11	31.35	6.76
39	SBI Magnum Equity Fund	-0.05	31.24	-9.20
40	UTI Master Index Fund	-1.74	35.71	-5.12
41	Zurich India Capital Builder - Growth	-2.02	31.20	6.76
42	UTI Masterplus Unit Scheme 91	-2.33	41.08	-2.44
43	JM Equity - Dividend	-2.50	21.10	-7.33
44	SUN F&C Value - Growth	-4.82	40.57	-1.35
45	SBI Magnum Multiplier Plus 93	-5.84	30.04	-16.34
46	Chola Freedom Technology - Cumulative	-7.41	39.97	0.31
47	LIC Dhanvikas (1)	-9.98	39.47	5.08
48	JM Equity - Growth	-15.78	26.03	-8.24

Source: www.mutualfundsindia.com. See the notes given below for workings.

Notes

Performances of all schemes are calculated for periods specified, as the absolute appreciation in the NAV values between the dates, after adjustment for dividends and bonuses. This method gives the due weightage for the dividends and bonuses paid in the scheme and also on the time when these were paid. The dividends paid are not considered to be re-invested in the same scheme but are inflated by the rate of risk free interest in the economy and adjusted. The reinvestment of dividend will mean the return equal to growth option. We have given weightage to the time value of money and taken the risk free rate of 8.5 per cent for calculations. This method is the most appropriate method for dividend adjustment.

Performance for a period less than a year is reported in absolute and that for a period more than a year is annualized. The actual calculation is explained-below

Let us consider

Nc = NAV for the current date;

Nc' = Present NAV after adjustment for dividend and bonuses;

Np = NAV of the day since when return has to be calculated;

D = dividend in percentage, announced between the period specified;

B= bonus announced between the period specified;

t = no. of days between the period of dividend announcement and current date;

Fv = Face Value of the scheme;

R = rate of risk free return (presently we are considering 8.5% as the rate of risk free returns as provided by RBI Relief Bonds)

Dividend adjustment

$$Nc' = Nc + [\{D * Fv/100\} *(1 + r/(100*365) ^ (t))]$$

Bonus adjustment

Let the bonus payment be represented in the form `a: b' i.e. `a' number of units for every 'b' units held.

$$Nc' = Nc * \{b/(a+b)\}$$

Return

$$Return = \{(N_c' - Np) * 100\} / Np$$

Note: The adjustment is done in the order of announcement from the present day to the date of announcement going in the reverse direction from present to past.