

Mutual Fund

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Chapter-10 MUTUAL FUNDS

* Investment Companies:

Investment companies are those companies who raise funds by issuing their own shares and use these funds to invest in the securities of other companies. There are generally following two types of investment companies:

1. Closed End Companies | closed End Fund
2. Open End Companies | Open End Fund

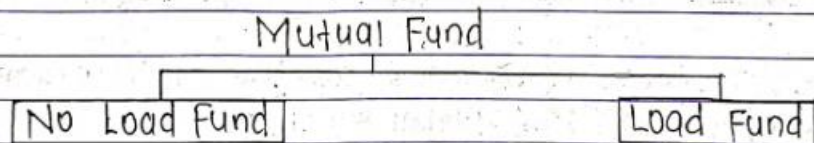
* Features of closed End Companies:

- a. These companies have fixed number of shares outstanding as these companies do not stand ready to issue or redeem their shares at any point of time.
- b. Shares of these companies are traded in organized stock exchanges, like Nepal stock Exchange (NEPSE) through the help of brokers. Broker charges commission while buying and selling the shares of these companies.

- c. The market price of shares of these companies are determined by the interaction of demand and supply in the market which may be above or below NAV per share.

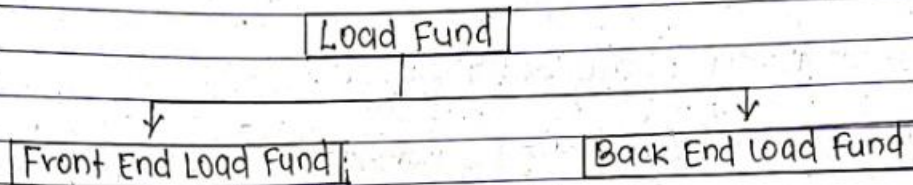
*** Features of Open End companies:**

- a. These companies do not have fixed number of shares outstanding as these companies stand ready to sell or redeem their own shares at any point of time.
- b. The shares of these companies are sold through the agents generally. Agent charges fee for his involvement which is called load fee.
- c. Shares of these companies are traded in NAV per share.
- d. Mutual Fund is a well known example of open end companies.

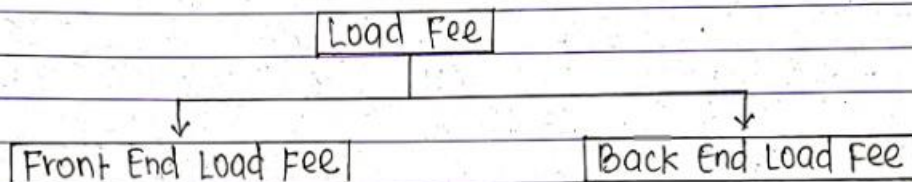


- **No Load Fund:** It is that type of mutual fund in which there occurs no load fee either at the time of purchase or sell or both.

- **Load Fund:** It is that type of mutual fund in which there occurs load fee either at the time of purchase or sell or both.



- **Front End Load fund:** It is that type of load fund in which load fee occurs only at the time of purchase of fund.
- **Back End Load Fund:** It is that type of load fund in which load fee occurs at the time of sell of fund.



- **Front End Load Fee / Load fee:** It occurs one at the time of purchase of mutual fund and reduces the amount of initial investment.

Example:

Amount available for Investment = Rs. 1000

Front end load fee = 10%

$$\begin{aligned}
 \% \text{ Net amount invested} &= \text{Amount available for investment} (1 - \% \text{ of front end load fee}) \\
 &= 1000 (1 - 0.10) \\
 &= \text{Rs. } 900
 \end{aligned}$$

$$\text{Let, NAV per share (NAV)} = \text{Rs. } 10$$

$$\begin{aligned}
 \% \text{ Number of shares to be purchased} \\
 (N) &= \frac{\text{Net Amount Invested}}{\text{NAV per share}} \\
 &= \frac{900}{10} = 90 \text{ shares}
 \end{aligned}$$

Alternatively,

$$\begin{aligned}
 \text{Offering price} &= \frac{\text{NAV per share}}{1 - \text{load fee}} \\
 &= \frac{10}{1 - 0.10} \\
 &= \text{Rs. } 11.11
 \end{aligned}$$

$$\begin{aligned}
 \% \text{ Number of shares (N)} &= \frac{\text{Amount available for investment}}{\text{Offering price}} \\
 &= \frac{1000}{11.11} \\
 &= 90 \text{ shares}
 \end{aligned}$$

Back End Load fee:

It occurs once at the time of sale of fund. It reduces the amount of sales from the investment.

Example:

Amount invested in fund = Rs. 1000

Annual HPR = 10%

Back end Fee = 2%

Net amount received from sales = ?

Here,

$$\begin{aligned}\text{Net amount received from sales} &= \text{Amount of Investment} (1 + \text{HPR})^n \\ &\quad (1 - \text{Back end load fee}) \\ &= 1000 (1 + 0.10)^1 (1 - 0.02) \\ &= \text{Rs. } 1078\end{aligned}$$

Annual 12(b)-1 charge/Management and Administrative fee:

It occurs annually and reduces the HPR to be received from the fund.

Example:

Annual HPR = 12%

Annual 12(b)-1 charge = 1%

$$\begin{aligned}\text{Net Annual HPR} &= \text{Annual HPR} - \text{Annual 12(b)-1 charge} \\ &= 12\% - 1\% \\ &= 11\%\end{aligned}$$

* Net Assets Value per share [NAV per share]

	No. of shares	Po	Total
stock			
Investors → Fund → Mutual Fund → A	1000 shares	Rs. 100	Rs. 100,000
← 1000 shares	2000 "	Rs. 50	Rs. 100,000
	500 "	Rs. 200	Rs. 100,000
Total Market value of Assets (MVA)			Rs. 300,000
- liabilities			Rs. 100,000
Net Assets value (Total)			Rs. 200,000
NAV per share = $\frac{\text{Total NAV}}{\text{No. of shares}} = \frac{200,000}{1000}$			
= Rs. 200 per share			

Conclusion:

$$\text{NAV per share} = \frac{\text{MVA}_t - \text{liabilities}_t}{N_t}$$

where,

MVA_t = Market value of Assets of mutual fund at time 't'.

liab._t = liabilities of mutual fund at time 't'.

N_t = Number of shares outstanding at time 't'.

* Calculation of Rate of Return on Mutual fund:

Sources of Return:

1. Capital Gain ($NAV_1 - NAV_0$)
2. Dividend or Interest.

Formula:

For No load fund:

$$HPR = \frac{(NAV_1 - NAV_0) + CG + ID}{NAV_0} \times 100$$

For Load fee

$$HPR = \frac{(NAV_1 - \text{offering price}) + CG + ID}{\text{offering price}} \times 100$$

Where,

$$\text{offering price} = \frac{NAV}{1 - \text{load fee}}$$

$$\text{Market Based HPR} = \frac{\text{Ending price} - \text{Beginning price} + \text{Div.}}{\text{Beginning price}} \times 100$$

* Concept of premium or discount on close-end fund:

As we know that, the price of close-end fund depends on demand and supply in the stock market. Thus, in most of the cases, the price of close end fund will be greater or lower than its NAV.

Then,

1. If current market price $>$ NAV $\rightarrow$ Premium
2. If current market price $<$ NAV $\rightarrow$ Discount
3. If current market price $=$ NAV $\rightarrow$ par

$$\% \text{ premium \%} = \frac{\text{Current MPS} - \text{NAV}}{\text{NAV}}$$

$$\% \text{ Discount \%} = \frac{\text{NAV} - \text{Current MPS}}{\text{NAV}}$$

Remarks:

The percentage of premium or discount is based on NAV.

$$\therefore \text{Current MPS} = \text{NAV} (1 + \text{premium} - \text{Discount})$$

* Portfolio Turnover Rate/Ratio [PTR]

- $\rightarrow$ It shows the level of activity in the fund.
- $\rightarrow$ It measures how actively and efficiently the fund managers involves in buying and selling securities.
- $\rightarrow$ It is calculated as follows:

Formula:

$$1: \frac{\text{Operating expenses Ratio}}{\text{Expenses Ratio}} = \frac{\text{Annual operating expenses}}{\text{Beginning NAV}}$$

2. Portfolio Turnover Ratio (PTR)

$$= \frac{\text{Minimum of the value of securities purchased or sold}}{\text{Average NAV}}$$

Where,

$$\text{Average NAV} = \frac{\text{Beginning NAV} + \text{Ending NAV}}{2}$$

Note:

Average NAV is also called Average daily total assets.

* Difference between open-end fund and close-end fund:

Basis of Difference	Open-End fund	close-End fund
1. Maturity period	NO	Fixed
2. Buy/sell	Directly through Fund	Through stock exchange
3. Selling price	NAV	Market price
4. No. of shares	variable	fixed
5. Redeemable	Yes	NO
6. Popularity	More popular	less popular
7. Liquidity	more liquid	less liquid.

Problem 10.1

Solⁿ

Given:

Total Assets (MVA) = Rs. 420 million

Liabilities (Liab.) = Rs. 6 million

Number of shares (N) = 20 million shares

Discount Rate = 10%

$$a. \text{ Net Assets Value (NAV)} = \frac{\text{MVA} - \text{Liab.}}{N}$$

$$= \frac{420 \text{ m} - 6 \text{ m}}{20 \text{ m}} = \text{Rs. } 20.7 \text{ per share}$$

$$b. \text{ Current price of the fund} = \text{NAV} (1 - \text{discount})$$

$$= 20.7 (1 - 0.10)$$

$$= \text{Rs. } 18.63 \text{ per share}$$

Problem 10.2

Solⁿ

Given:

Number of shares (N) = 150,000 shares

Management fee obligations (Liab.) = Rs. 50,000

Market value of Assets (MVA) = $(5000 \times 100) + (2000 \times 70) + (3500 \times 300)$
= Rs. 16,90,000

$$\text{Net Assets Value (NAV)} = \frac{\text{MVA} - \text{Liab.}}{N} = \frac{16,90,000 - 50,000}{150,000}$$

$$= \text{Rs. } 10.93 \text{ per share}$$

Problem 10.3

Solⁿ

Given:

$$\text{Market value of Assets (MVA)} = (1000 \times 150) + (2000 \times 140) \\ = \text{Rs. } 430,000$$

$$\text{Number of shares (N)} = 10,000 \text{ shares}$$

$$\text{Liabilities (liab.)} = 0$$

$$\text{a. NAV} = \frac{\text{MVA} - \text{liab.}}{N} = \frac{430,000 - 0}{10,000} = \text{Rs. } 43 \text{ per share}$$

$$\text{b. Market Value of Assets (MVA)} = (1000 \times 180) + (2000 \times 110) \\ = \text{Rs. } 400,000$$

$$\text{Expected NAV} = \frac{\text{MVA} - \text{liab.}}{N} = \frac{400,000 - 0}{10,000} = \text{Rs. } 40 \text{ per share}$$

c. Let the price of ABC should be x to get NAV calculated in part a.

$$\text{NAV} = \frac{\text{MVA} - \text{liab.}}{N}$$

$$43 = \frac{[(1000 \times 180) + (2000 \times x)] - 0}{10,000}$$

$$430,000 = 180,000 + 2000x$$

$$2000x = 250,000$$

$$x = \frac{250,000}{2000} = \text{Rs. } 125$$

Therefore, the price of ABC Co. should decline by Rs.15 (140-125) to maintain the NAV as estimated in (a).

Problem 10.4

Solⁿ

Given:

$$\begin{aligned} \text{a. } HPR_{2014} &= \frac{NAV_{2015} - NAV_{2014} + D_{2014} + CG_{2014}}{NAV_{2014}} \times 100 \\ &= \frac{150 - 100 + 7.55 + 30}{100} \times 100 \\ &= 87.55\% \end{aligned}$$

$$\begin{aligned} \text{b. } HPR_{2015} &= \frac{NAV_{2016} - NAV_{2015} + D_{2015} + CG_{2015}}{NAV_{2015}} \times 100 \\ &= \frac{120 - 150 + 6 + 10}{150} \times 100 \\ &= -9.33\% \end{aligned}$$

Problem 10.5

Solⁿ

Given:

Amount of Investment = Rs.10,000

Beginning price = Rs.120 (Purchase price)

Commission = 3%

Dividend = Rs.10 per share

Ending price / Selling price = Rs.125

a. HPR considering Brokerage Commission

$$\begin{aligned} &= \frac{\text{Net selling price} - \text{Net purchase price} + \text{Dividend}}{\text{Net purchase price}} \times 100 \\ &= \frac{121.25 - 123.6 + 10}{123.6} \times 100 \\ &= 6.19\% \end{aligned}$$

where

$$\text{Net pp} = 120(1 + 0.03) = \text{Rs. } 123.6$$

$$\text{Net sp} = 125(1 - 0.03) = \text{Rs. } 121.25$$

b. HPR without Considering Brokerage Commission

$$\begin{aligned} &= \frac{\text{Selling price} - \text{purchase price} + \text{Dividend}}{\text{purchase price}} \times 100 \\ &= \frac{125 - 120 + 10}{120} \times 100 \\ &= 12.5\% \end{aligned}$$

Problem 10.6

Solⁿ

Given:

$$\text{Amount Invested} = \text{Rs. } 10,000$$

$$\text{Beginning NAV (NAV}_0\text{)} = \text{Rs. } 120$$

$$\text{Offering price} = \text{Rs. } 124$$

$$\text{Dividend per share} = \text{Rs. } 1$$

$$\text{Ending NAV (NAV}_1\text{)} = \text{Rs. } 125$$

$$\begin{aligned}
 \text{a. HPR (with load fee)} &= \frac{\text{NAV}_1 - \text{offering price} + \text{Div.}}{\text{offering price}} \times 100 \\
 &= \frac{125 - 124 + 1}{124} \times 100 \\
 &= 1.6129 \%
 \end{aligned}$$

$$\begin{aligned}
 \text{b. HPR (no load fee)} &= \frac{\text{NAV}_1 - \text{NAV}_0 + \text{Div.}}{\text{NAV}_0} \times 100 \\
 &= \frac{125 - 120 + 1}{120} \times 100 \\
 &= 5 \%
 \end{aligned}$$

Problem 10.7

Solⁿ

Given:

Beginning no. of shares (N) = 200 shares

Beginning NAV (NAV₀) = Rs. 8.50

Dividend (Div.) = Rs. 0.90

Capital Gain (CG) = Rs. 0.75

$$\text{a. Ending NAV (NAV}_1\text{)} = \text{Rs. 9.10}$$

$$\begin{aligned}
 \text{HPR} &= \frac{\text{NAV}_1 - \text{NAV}_0 + \text{Div.} + \text{CG}}{\text{NAV}_0} \times 100 \\
 &= \frac{9.10 - 8.50 + 0.90 + 0.75}{8.50} \times 100 \\
 &= 26.47 \%
 \end{aligned}$$

$$\begin{aligned} \text{b. Total amount from dividend and capital gain} \\ &= (0.90 + 0.75) \times 200 \text{ shares} \\ &= \text{Rs. } 330 \end{aligned}$$

$$\begin{aligned} \text{Additional shares} &= \frac{330}{8.75} = 37.71 \text{ shares} \end{aligned}$$

$$\text{Ending shares} = 237.71 \text{ shares } (200 + 37.71)$$

$$\begin{aligned} \text{HPR} &= \frac{\text{Ending value} - \text{Beginning value}}{\text{Beginning value}} \times 100 \\ &= \frac{(237.71 \times 9.10) - (200 \times 8.50)}{200 \times 8.50} \times 100 \\ &= 27.24 \% \end{aligned}$$

Problem 10.8

Solⁿ

Given:

$$\text{Beginning NAV (NAV}_0\text{)} = \text{Rs. } 21.50$$

$$\text{Beginning offering price} = \text{Rs. } 23.35$$

$$\text{Ending NAV (NAV}_1\text{)} = \text{Rs. } 23.04$$

$$\text{Ending offering price} = \text{Rs. } 25.04$$

$$\text{Dividend and capital gain} = \text{Rs. } 1.05$$

$$\begin{aligned} \text{Holding Period Return} &= \frac{\text{NAV}_1 - \text{offering price} + \text{Div. \& CG}}{\text{offering price}} \times 100 \\ &= \frac{23.04 - 23.35 + 1.05}{23.35} \times 100 \\ &= 3.17 \% \end{aligned}$$

Problem 10.9

Solⁿ

$$HPR = \frac{NAV_t - \text{Offering price} + \text{Div.} + \text{CG}}{\text{Offering price}} \times 100$$

$$HPR_{2013} = \frac{43.20 - 55 + 2.10 + 1.83}{55} \times 100 = -14.31\%$$

$$HPR_{2014} = \frac{60.47 - 46.20 + 2.84 + 6.26}{46.20} \times 100 = 50.58\%$$

$$HPR_{2015} = \frac{54.75 - 64.68 + 2.61 + 4.32}{64.68} \times 100 = -4.64\%$$

Calculation of Average annual compound rate of return over the 3-year period, 2013-2015.

Year	0	1	2	3
Purchase price	(55)			
Dividend		2.10	2.84	2.61
Capital Gain		1.83	6.26	4.32
Selling price				54.75
Total Cash flow	(55)	3.93	9.10	61.68

Calculation of compound rate of return using IRR approach

$$CF_0 = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3}$$
$$55 = \frac{3.93}{(1+r)^1} + \frac{9.10}{(1+r)^2} + \frac{61.68}{(1+r)^3} \quad \text{--- (1)}$$

Now,

$$\text{Required Factor} = \frac{CF_0}{\text{Average CFAT}} = \frac{55}{24.9033} = 2.2088$$

$$\text{Average CFAT} = \frac{3.93 + 9.10 + 61.68}{3} = 24.9033$$

Looking at PVIFA table at 3rd year, the required factor lies between 17% and 18%. Since, the initial years cash flow is lower than the final year's cash flow, actual return will be less than 17%. So, let's try at 10%.

$$TPV_{10} = \frac{3.93}{(1+0.10)^1} + \frac{9.10}{(1+0.10)^2} + \frac{61.68}{(1+0.10)^3}$$
$$= 57.43$$

Try at 13%

$$TPV_{13} = \frac{3.93}{(1+0.13)^1} + \frac{9.10}{(1+0.13)^2} + \frac{61.68}{(1+0.13)^3}$$
$$= \text{Rs. } 53.48$$

By Interpolation,

$$\begin{aligned}\text{Annual Return} &= LR + \frac{TPV_{LR} - CF_0}{TPV_{LR} - TPV_{HR}} \times (HR - LR) \\ &= 10\% + \frac{57.43 - 55}{57.43 - 53.48} \times (13 - 10) \\ &= 11.84\%\end{aligned}$$

Problem 10.10

Solⁿ

Given:

$$\text{Beginning NAV (NAV}_0\text{)} = \text{Rs. } 10.40$$

$$\text{Discount} = 18\%$$

$$\begin{aligned}\text{Market price at beginning} &= \text{NAV} (1 - \text{discount}) \\ &= 10.40 (1 - 0.18) \\ &= \text{Rs. } 8.53\end{aligned}$$

$$\text{Ending NAV (NAV}_1\text{)} = \text{Rs. } 11.69$$

$$\text{premium} = 4\%$$

$$\begin{aligned}\text{Market price at end} &= \text{NAV} (1 + \text{premium}) \\ &= 11.69 (1 + 0.04) \\ &= \text{Rs. } 12.16\end{aligned}$$

Divi

$$\text{Dividend (Div.)} = \text{Rs. } 0.40$$

$$\text{Capital Gain (CG)} = \text{Rs. } 0.95$$

$$Q. \text{ NAV based HPR} = \frac{\text{NAV}_1 - \text{NAV}_0 + \text{Div.} + \text{CG}}{\text{NAV}_0} \times 100$$

$$= \frac{11.69 - 10.40 + 0.40 + 0.95}{10.40} \times 100$$

$$= 25.38\%$$

b. Market based HPR = $\frac{\text{Ending price} - \text{Beginning price} + \text{Div.} + \text{CG}}{\text{Beginning price}} \times 100$

$$= \frac{12.16 - 8.53 + 0.40 + 0.95}{8.53} \times 100$$

$$= 58.38\%$$

The market premium/discount added value to the investor's return because market based HPR is higher than the NAV based HPR.

c. Beginning Market price = $\text{NAV}_0 (1 + \text{premium})$

$$= 10.40 (1 + 0.18) = \text{Rs. } 12.27$$

Ending Market price = $\text{NAV}_1 (1 - \text{discount})$

$$= 11.69 (1 - 0.04) = \text{Rs. } 11.22$$

Market based HPR = $\frac{\text{Ending price} - \text{Beginning price} + \text{Div.} + \text{CG}}{\text{Beginning price}} \times 100$

$$= \frac{11.22 - 12.27 + 0.40 + 0.95}{12.27} \times 100$$

$$= 2.45\%$$

There is a huge change in rate of return due to the change in discount and premium.

Problem 10.11

Solⁿ

$$\begin{aligned} \text{a. NAV based HPR} &= \frac{\text{NAV}_1 - \text{NAV}_0 + \text{Div.} + \text{CG}}{\text{NAV}_0} \times 100 \\ &= \frac{9.25 - 7.50 + 1.20 + 0.90}{7.50} \times 100 \\ &= 51.33\% \end{aligned}$$

b. Beginning of the Year: (MPS > NAV)

$$\begin{aligned} \text{Premium \%} &= \frac{\text{MPS} - \text{NAV}}{\text{NAV}} \times 100 \\ &= \frac{7.75 - 7.50}{7.50} \times 100 \\ &= 3.33\% \end{aligned}$$

End of the year: (MPS < NAV)

$$\begin{aligned} \text{Discount \%} &= \frac{\text{NAV} - \text{MPS}}{\text{NAV}} \times 100 \\ &= \frac{9.25 - 9.00}{9.25} \times 100 \\ &= 2.7\% \end{aligned}$$

$$\begin{aligned}
 \text{C. Market Based HPR} &= \frac{\text{Ending price} - \text{Beginning price} + \text{Div.} + \text{CG}}{\text{Beginning price}} \times 100 \\
 &= \frac{9.00 - 7.75 + 1.20 + 0.90}{7.75} \times 100 \\
 &= 43.23\%
 \end{aligned}$$

Premium/discount hurt the HPR. Investor purchased the share at premium and sold them at discount as a result HPR decreased.

Problem 10.12

Solⁿ

Given:

Beginning no. of shares = 1000 shares

Beginning NAV = Rs. 20

Beginning value = $1000 \times 20 = \text{Rs. } 20,000$ (PV)

Ending no. of shares = 1100 shares

Ending NAV = 22.91

Ending value = $1100 \times 22.91 = \text{Rs. } 25201$ (FV)

Holding period (n) = 3 years

a. $FV = PV(1+r)^n$

$$25201 = 20,000(1+r)^3$$

$$\frac{25201}{20,000} = (1+r)^3$$

$$r = \left[\frac{25201}{20,000} \right]^{1/3} - 1 = 8\%$$

$$b. \text{Offering price} = \frac{\text{NAV}}{1 - \text{load fee}} = \frac{20}{1 - 0.03} = \text{Rs. } 20.62$$

$$\text{Beginning value} = 1000 \times 20.62 = \text{Rs. } 20,620$$

$$FV = PV(1+r)^n$$

$$25201 = 20620(1+r)^3$$

$$\therefore r = \left[\frac{25201}{20620} \right]^{1/3} - 1 = \cancel{6.92} / 6.92\%$$

Problem 10.13

sqd

Portfolio Turnover Rate = $\frac{\text{Minimum value of buying or selling securities}}{\text{Average NAV}}$

$$= \frac{15,000,000}{1500,000 \times 28} = 0.357 \text{ times}$$

Where,

$$\text{Purchase Value} = 200,000 \times 50 + 200,000 \times 25 = \text{Rs. } 15,000,000$$

$$\text{Selling value} = 600,000 \times 25 = \text{Rs. } 15,000,000$$

$$\text{NAV} = \frac{\text{Total assets} - \text{liab.}}{\text{Number of shares}}$$

$$= \frac{(200,000 \times 35 + 300,000 \times 40 + 400,000 \times 20 + 600,000 \times 25) - 0}{15,00,000}$$

$$= \text{Rs. } 28$$

Problem 10.14

Solⁿ

Given:

$$\text{HPR} = .12\%$$

$$\text{Amount Invested} = \text{Rs. } 10,000$$

a. Holding period (n) = 3 years

$$\text{Anticipated Rupee value (FV)} = \text{PV} (1 + \text{HPR})^n (1 - \text{load fee})$$

Fund X:

$$\text{FV} = 10,000 (1 + 0.11)^3 (1 - 0) = \text{Rs. } 13,676.31$$

Fund Y:

$$\text{FV} = 10,000 (1 + 0.12)^3 (1 - 0.04) = \text{Rs. } 13,487.31$$

Fund X seems to be a better alternative due to higher anticipated value.

b. Holding period (n) = 6 years

Fund X:

$$\text{FV} = 10,000 (1 + 0.11)^6 (1 - 0) = \text{Rs. } 18,704.15$$

Fund Y:

$$\text{FV} = 10,000 (1 + 0.12)^6 (1 - 0.04) = \text{Rs. } 18,948.69$$

c. For Indifference Holding Period Return

$$\begin{aligned} \text{FV of Fund X} &= \text{FV of Fund Y} \\ 10,000(1+0.11)^n(1-0) &= 10,000(1+0.12)^n(1-0.04) \\ (1.11)^n &= (1.12)^n \times 0.96 \end{aligned}$$

$$\frac{(1.11)^n}{(1.12)^n} = 0.96$$

$$\left(\frac{1.11}{1.12}\right)^n = 0.96$$

$$(0.99107)^n = 0.96$$

Taking log on both side

$$n \log 0.99107 = \log 0.96$$

$$n = \frac{\log 0.96}{\log 0.99107}$$

$$= 4.55 \text{ Years}$$

d. The length of the anticipated holding period should be considered in comparing load fees with annual expenses such as 12b-1 charge because load fee is charged only once at the time of purchase whereas Annual 12b-1 charge is charged annually.

Problem 10.15

Soln

Given:

Amount Invested = Rs. 1000

Load fee = 8.5%

Management and other fees (Annual 12b-1 charge) = 1.10%

Holding period (n) = 5 Yrs

Interest in saving account (i) = 5 %

Holding period Return (HPR) = ?

Fund from investing in Mutual fund = Amount from Saving account

$$1000 (1 + \text{HPR} - 0.01)^5 (1 - 0.989) = 1000 (1 + 0.05)^5$$

$$1000 (0.989 + \text{HPR})^5 \times 0.915 = 1000 \times (1.05)^5$$

$$(0.989 + \text{HPR})^5 = \frac{(1.05)^5}{0.915}$$

$$(0.989 + \text{HPR})^5 = 1.3945$$

$$\text{HPR} = (1.3945)^{1/5} - 0.989$$

$$= 7.98\%$$

Problem 10.16

Soln

Given:

	Fund E	Fund D	Fund N	Fund L
Amount Invested	Rs. 1000	Rs. 1000	Rs. 1000	Rs. 1000
NAV	Rs. 10	Rs. 10	Rs. 10	Rs. 10
Market price	Rs. 10	Rs. 8	-	-
Commission	2%	2%	-	-
Load fee	-	-	-	8.5%

$$\text{Number of shares (N)} = \frac{\text{Amount invested}}{\text{Cost per share}}$$

Fund E:

$$\text{Number of shares (N)} = \frac{\text{Rs. 1000}}{10 + 2\% \text{ of } 10} = 98.04 \text{ shares}$$

Fund D:

$$\text{Number of shares (N)} = \frac{\text{Rs. 1000}}{8 + 2\% \text{ of } 8} = 122.55 \text{ shares}$$

Fund N:

$$\text{Number of shares (N)} = \frac{\text{Rs. 1000}}{\text{Rs. 10}} = 100 \text{ shares}$$

Fund L:

$$\text{Number of shares (N)} = \frac{\text{Rs. 1000}}{\text{Rs. 10.93}} = 91.49 \text{ shares}$$

where,

$$\text{Offering price} = \frac{\text{NAV}}{1 - \text{load fee}} = \frac{10}{1 - 0.085} = \text{Rs. 10.93}$$

Problem 10.17

Soln

$$a. \text{ NAV per share} = \frac{\text{Total net assets}}{\text{Number of shares}}$$

Fund A

$$\text{NAV at beginning} = \frac{10,00,000}{100,000} = \text{Rs. 10}$$

$$\text{NAV at end} = \frac{11,00,000}{110,000} = \text{Rs. 10}$$

Fund B

$$\text{NAV at beginning} = \frac{10,00,000}{100,000} = \text{Rs. 10}$$

$$\text{NAV at end} = \frac{12,00,000}{100,000} = \text{Rs. 12}$$

$$b. \text{ Expenses Ratio} = \frac{\text{Operating expenses}}{\text{Beginning Net assets}}$$

$$\text{Fund A} = \frac{\text{Rs. 10,000}}{\text{Rs. 10,00,000}} = 0.01 = 1\%$$

$$\text{Fund B} = \frac{12,000}{10,00,000} = 0.012 = 1.2\%$$

c. Portfolio Turnover Ratio = $\frac{\text{Minimum Value of sold or purchase}}{\text{Average Net Assets value}}$

$$\text{Fund A} = \frac{400,000}{(10,00,000 + 11,00,000)/2} = 0.3809$$

$$\text{Fund B} = \frac{800,000}{(10,00,000 + 12,00,000)/2} = 0.7272$$

d. The higher operating expenses for Fund B are justified because it has higher value of securities purchased and sold during the year.

e. The higher portfolio turnover ratio and brokerage fees for Fund B are justified because it has higher value of securities purchased and sold during the year.

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