SUNDARAM MUTUAL
Sundaram Finance Group

Risk Measures - Calculation Methodology for Factsheet

Sr.No.	Parameter	Calculation methodology / formulae
1	***Total Expense Ratio***	Weighted Average i.e. Total Expense of the month / Average Asset / number of days in month * days in a year
2	***Sharpe Ratio***	(Ri-Rf)/Stdev of Fund returns Where, Ri= Fund Return Rf = Risk free Return (TREPs) TREPs would serve as a more appropriate risk free rate instead of MIBOR as Mutual Funds deploy idle cash in TREPs.
3	***Beta Ratio***	Covariance of NAV returns vs Index returns/ Variance of Index returns Further, for Beta, as Benchmark Total Return may not be easily available /calculated, price return is suggested to be used.
4	***Standard Deviation of Returns***	Standard Deviation should reflect for the Fund as well as the relevant benchmark – $s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$ where, s = Standard Deviation x is the return series $\bar{X}$ is the mean of the return series N is the no of values ***Note:*** *Standard Deviation of returns may be measured considering the data using the formula STDEV.S() in Microsoft Excel*
5	***Modified Duration***	= Macaulay Duration / (1 + Annualised Yield)
6	***Macaulay Duration***	Macaulay Duration is a measure of the average time it takes to receive a bond's cash flows. It is calculated by summing up all the multiples of the present values of cash flows and corresponding time periods and then dividing the sum by the market bond price. It can be calculated using the following formula: $\text{Macaulay Duration} = \frac{\sum_{t=1}^{n} PV(CF_t) * t}{\text{Market Bond Price}} = \frac{\sum_{t=1}^{n} \frac{t * C}{(1+Y)^t} + \frac{n * M}{(1+Y)^t}}{\text{Market Bond Price}}$ Where: • **PV(CF$_t$)** – Present value of cash flow (coupon) at period t • **t** – Time period for each cash flow • **C** – Periodic coupon payment • **n** – Total number of periods to maturity • **M** – the Bond's maturity value • **Y** – Periodic yield

7	***Portfolio Turnover Ratio (Not applicable to Passive Funds)***	Calculation method: Lower of purchase or sale during the period/Average AUM for the period. The period to be considered is last one year. TREPS/CBLO/Repo/FD/Margin FD/ MFU/SLB are not considered for purchase and sale. Should include Fixed income securities and Equity derivatives
8	***Average Maturity***	Weighted avg maturity of the assets
9	***Portfolio Yield***	Weighted Average valuation yield of the assets – Disclosure required only for Debt funds.
10	***Risk Free Return***	TREPs would serve as a more appropriate risk free rate instead of currently used MIBOR as Mutual Funds deploy idle cash in TREPs. Risk Free Return to be taken as WAR TREP of the last working day.
11	***Tracking Error***	**Step 1:** Obtain the NAV values and the TR Index values for each day of the total time period required **Step 2:** Calculate the percentage change in the NAV and TR Index for each day over its previous day Percentage change in the NAV = $\frac{\text{NAV as on day (t)} - \text{NAV as on day(t-1)}}{\text{NAV as on day (t-1)}}$ **Step 3:** Calculate the difference between the percentage change in the NAV and the percentage change in the TR Index for each day **Step 4:** Calculate the standard deviation of the difference obtained from day(1) to day(n) in **Step 5:** Calculate the Annualised Tracking error as per the formula given below *Annualised Tracking Error = Standard Deviation (obtained as per Step 4) sqrt (250)*
12	***Tracking Difference***	Tracking Difference = Scheme returns – Benchmark index returns

Note

a. Standard Deviation, Beta and Tracking Error should be computed taking similar data points.

b. For Schemes that have completed 3 years, 3-year data shall be provided; and for Schemes that have completed more than 1 year but not completed 3 years1-year data shall be provided.

c. For Fund of Funds and International Equity Funds these measures are not required to be reflected.