Mutual Fund Ratios - Beta, SD and R-Squared
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Investing by considering only historical returns in a mutual fund scheme is risky. Investors need to evaluate the risk involved in mutual fund schemes before investing. In this article we will cover significance of Beta and Standard Deviation.

Beta

Definition:
It measures a fund's volatility compared to that of a benchmark. It tells you how much a fund's performance would swing compared to a benchmark.

Computation:
\[
\text{Beta} = \frac{\text{Standard Deviation of Fund}}{\text{Standard Deviation of Benchmark}} \times \text{R-Square}
\]

Significance
- Depicts how much a fund's performance would swing compared to a benchmark.

<table>
<thead>
<tr>
<th>Beta</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This happens when the stock price movement is same as that of market.</td>
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<tr>
<td>&gt; 1</td>
<td>Beta exceeds one when the stock price movement surpass market movement.</td>
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<tr>
<td>&lt; 1</td>
<td>This happens when the stock price moves less in comparison of market.</td>
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Standard Deviation

Definition:
Standard deviation (SD) measures the volatility the fund's returns in relation to its average. It tells you how much the fund's return can deviate from the historical mean return of the scheme. If a fund has a 12% average rate of return and a standard deviation of 4%, its return will range from 8-16%.

Computation:
\[
\text{Standard Deviation (SD)} = \sqrt{\text{Variance (V)}}
\]
\[
\text{Variance} = \frac{(\text{Sum of squared difference between each monthly return and its mean})}{\text{number of monthly return data} - 1}
\]

Significance
- The higher the number, the more volatile is the fund's returns. Investors prefer funds with lower volatility.
R-Squared

**Definition:**

R-Squared measures the relationship between a portfolio and its benchmark. It can be thought of as a percentage from 1 to 100.

R-squared is not a measure of the performance of a portfolio. A great portfolio can have a very low R-squared. It is simply a measure of the correlation of the portfolio's returns to the benchmark's returns.

**Computation:**

R-Squared = Square of Correlation *

Formula for Correlation *:

\[
\text{Correlation}_{xy} = \frac{\text{Covariance between index and portfolio}}{\text{Standard deviation of portfolio} \times \text{standard deviation of index}}
\]

**Significance**

- If you want a portfolio that moves like the benchmark, you'd want a portfolio with a high R-squared. If you want a portfolio that doesn't move at all like the benchmark, you'd want a low R-squared.
- General Range for R-Squared:
  - 70-100% = good correlation between the portfolio's returns and the benchmark's returns
  - 40-70% = average correlation between the portfolio's returns and the benchmark's returns
  - 1-40% = low correlation between the portfolio’s returns and the benchmark's returns
- Index funds will have an R-squared very close to 100.
- R-squared can be used to ascertain the significance of a particular beta or alpha. Generally, a higher R-squared will indicate a more useful beta figure. If the R-squared is lower, then the beta is less relevant to the fund’s performance
- Values range from 1 (returns are explained 100% by the market) to 0 (returns bear no association with the market)

We will explain Information Ratio and its significance in the next article.

**Mutual fund investments are subject to market risks, read all scheme related documents carefully.**