

Return Metrics and Statistics

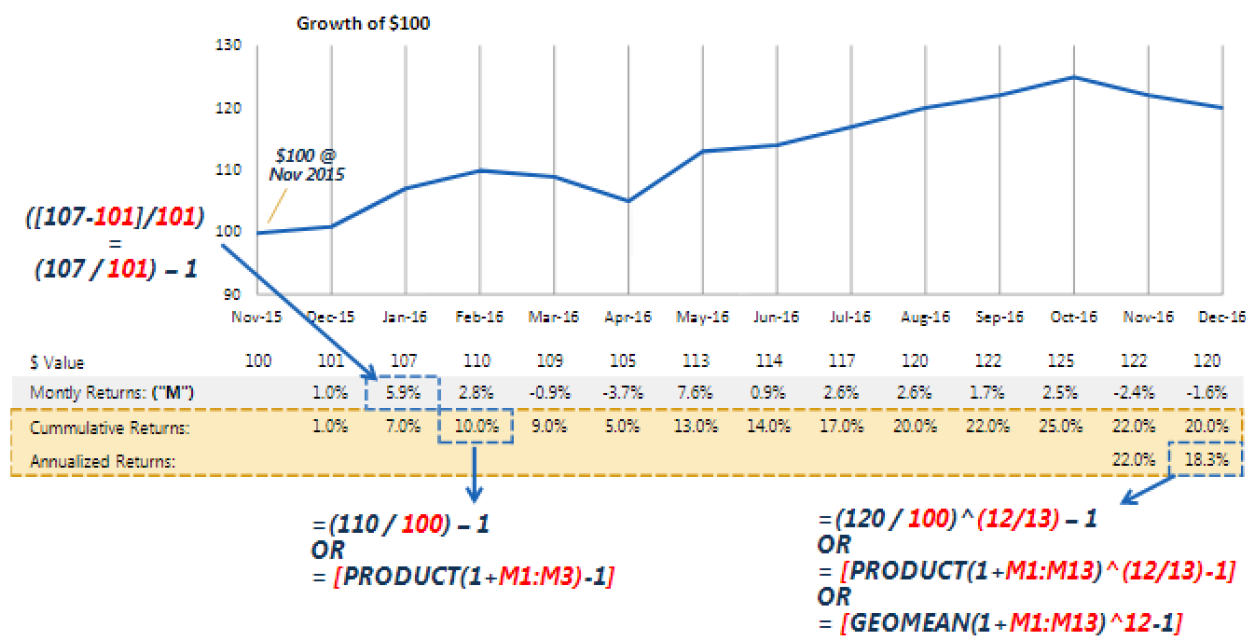
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1. Holding Period Return

Holding Period Return

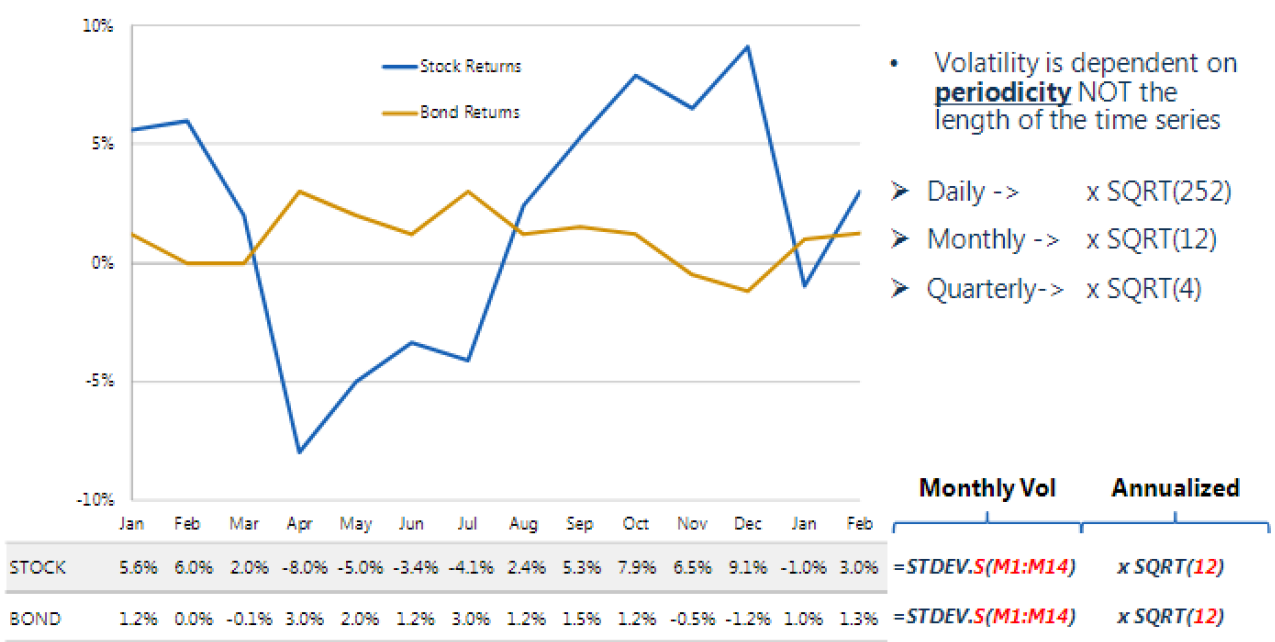
= (Income + (End Of Period Value - Initial Value)) / Initial Value

- Annualized Return needs to be adjusted by 12/13



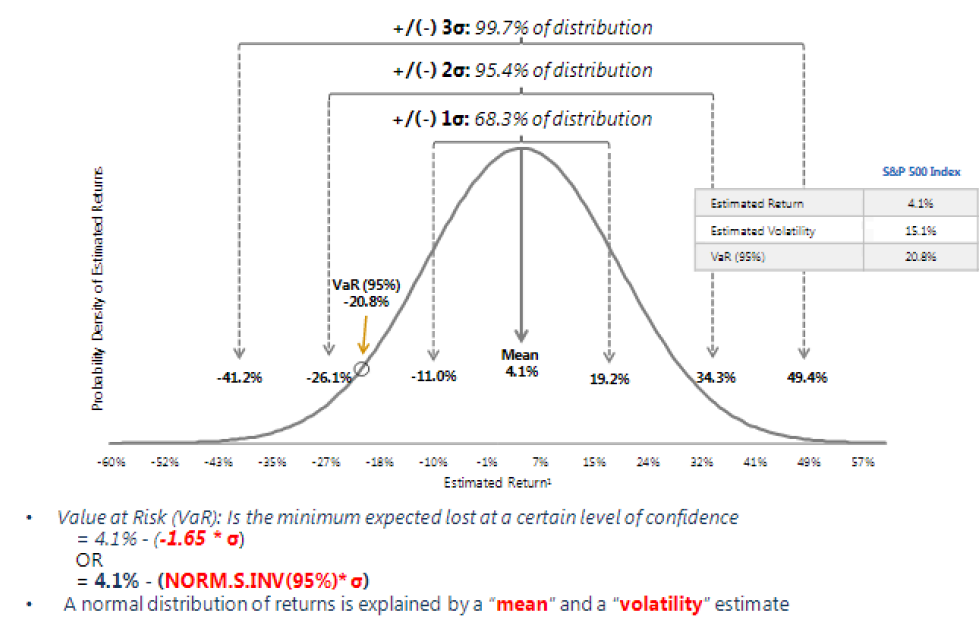
2. Volatility

- Standard deviation of returns of each period
- Annualized volatility needs to times the square root of periodicity



3. Value at Risk (VaR)

- Minimum expected gain (maximum expected loss) at a certain level of confidence
- Assume bell curve of returns, estimated based on mean and volatility (standard deviation)



- Ex-post volatility: historical volatility -> assess historical risk and return
- Ex-ante volatility: forward looking volatility -> typically used in portfolio construction

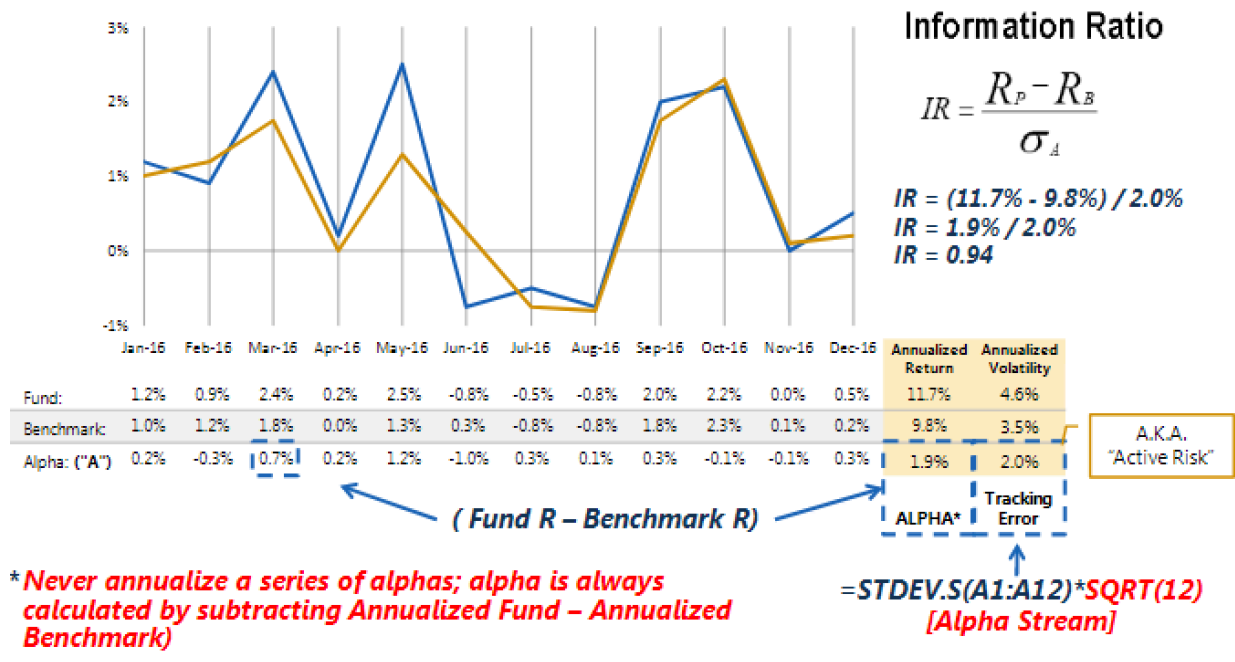
4. Sharpe Ratio

S = (Rp - Rf) / sigma_p

- Return of portfolio, minus return of risk free rate, divided by volatility of portfolio

5. Tracking Error and Information Ratio

- Alpha = Portfolio return - benchmark return
- Tracking error = volatility of alpha
- Information Ratio = (return of portfolio - return of benchmark) / tracking error
- Tule of thumb: IR > 0.5 is strong in information ratio

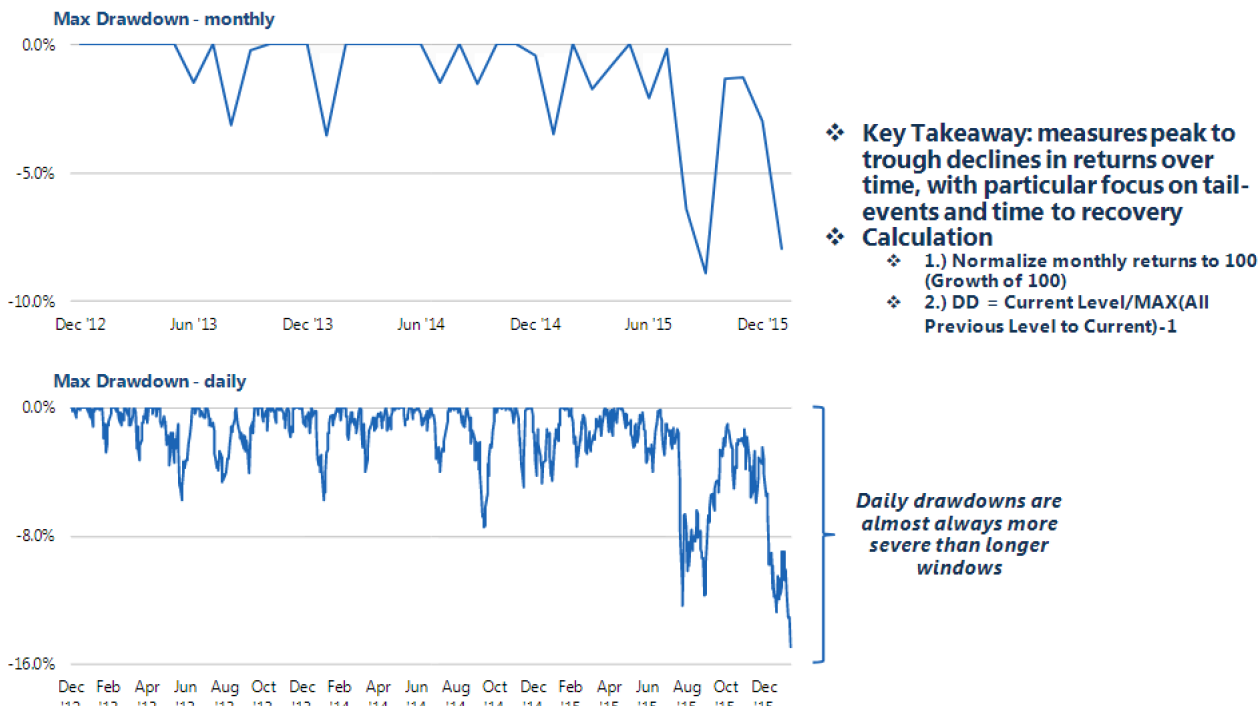


6. Upside/Downside Capture Ratio

- How much percent return captured in comparison with benchmark
- Upside capture ratio the higher the better, downside capture ratio the lower the better

7. Drawdown

- DD = [Current Level / max(all periods up to current)] - 1
- Measures peak to trough returns in decline over time, with particularly focus on tail events



8. Correlation vs. Beta

