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Notes on Statistical Ratios used in PMI-prepared Reports

SHARPE RATIO

The Sharpe Ratio is the ratio of "excess return" to volatility. Excess return is defined as the annualized rate of return less the risk-free rate (PMI tracks 30 day T-bill returns), compounded monthly. The volatility measure is the annualized standard deviation of monthly excess returns. Higher Sharpe ratios reflect more favorable risk-adjusted performance.

SORTINO RATIO

The Sortino Ratio is a variation of the Sharpe ratio which distinguishes between negative and positive volatility. Volatility in a managed fund would be expected to be asymmetric, since money managers attempt to limit losses. The Sortino ratio uses the concept of an arbitrary "minimal acceptable return" – MAR – instead of the risk-free rate. The measure of negative volatility, or "downside deviation," is calculated on results which are less than the monthly MAR. The Sortino Ratio is the return in excess of the MAR divided by the downside deviation. Sortino Ratios are expressed as a ratio with the assumed MAR in parentheses following.

STANDARD DEVIATION

Standard deviation measures the distribution of returns about the mean. Low standard deviations reflect low variation in monthly results; higher variability is usually interpreted as higher risk. Standard deviations are based on monthly results, then annualized.

DOWNSIDE DEVIATION

Calculated much like standard deviation, Downside Deviation – DD – is a measure of the volatility of results which are less than the monthly MAR – the "minimum acceptable return." DD is an alternative to the standard deviation of all results in a data set, and distinguishes between negative and positive volatility. Downside deviation is accompanied by the assumed MAR in parentheses.

REGRESSION STATISTICS

Regression models are used to predict one variable based on the observations of another variable. For our purposes, the independent variable is an index return and the dependent variable is the performance of the fund. Visually, the monthly results of each are plotted on a "scatter graph," each point representing an "x" value equal to the index return and a "y" value equal to the fund return for the same month. A "least-squares" linear regression line is calculated as a "best fit" to represent the data points. Note that some more complex calculation methods use the fund's return in excess of T-bills as the dependent variable. PMI uses the fund's absolute return.

CORRELATION

Correlation ("R") is a measure of the degree of linear relationship between two variables, in this case, the relationship between the monthly returns of the fund and an index. 1.00 would indicate perfect positive correlation; 0.00, no correlation; and –1.00, perfect negative correlation.

R-SQUARED

The square of correlation serves as an indication of the "fit" of the data points to the regression line. An R-squared of 1.00 would indicate that each data point was located on the regression line; in other words, a perfect fit. An R-squared near zero would indicate that the regression line is essentially meaningless – data points appear random and do not strongly support the regression line. A low R-squared is generally appealing when seeking an investment which acts independently of the market index.

ALPHA

If one pictures the linear regression line, alpha is equal to the "y-intercept" – the "y" value where the regression line crosses the "y" axis. This is the expected return when the index return – the "x" value – is zero. In other words, it is the intrinsic return of the fund in the absence of market influence. As alpha is calculated on monthly data, an annualized figure is also provided.

BETA

The slope of the regression line is beta. A positive beta indicates that fund returns have been better when the index return is better. A negative beta would indicate better results in declining markets. Beta is a measure of a fund's susceptibility to the extent and direction of market volatility.

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