The following section provides a brief description of each statistic used in PerTrac and gives the formula used to calculate each. PerTrac computes annualized statistics based on monthly data, unless Quarterly data is specified.

Value Added Monthly Index (VAMI) - This index reflects the growth of a hypothetical $1,000 in a given investment over time. The index is equal to $1,000 at inception. Subsequent month-end values are calculated by multiplying the previous month's VAMI index by 1 plus the current month rate of return.

Where Vami 0 = 1000 and
Where R_N = Return for period N

$$\mathbf{Vami_N} = \left(1 + R_N\right) \times \text{Vami}_{N-1}$$

Average Return (Mean) - This is a simple average return (arithmetic mean) which is calculated by summing the returns for each period and dividing the total by the number of periods. The simple average does not take the compounding effect of investment returns into account.

Where N = Number of periods
Where R_I = Return for period I

$$\textbf{Average Return} = \left(\sum_{I=1}^{N} R_I \right) \div N$$

Average Gain (Gain Mean) - This is a simple average (arithmetic mean) of the periods with a gain. It is calculated by summing the returns for gain periods (return ≥ 0) and then dividing the total by the number of gain periods.

Where N = Number of periods
Where R_I = Return for period I
Where $G_I = R_I$ (IF $R_I \geq 0$) or 0 (IF $R_I < 0$)
N_G = Number of periods that $R_I \geq 0$

$$\textbf{Average Gain} = \left(\sum_{I=1}^{N} G_I \right) \div N_G$$

Average Loss (Loss Mean) - This is a simple average (arithmetic mean) of the periods with a loss. It is calculated by summing the returns for loss periods (return < 0) and then dividing the total by the number of loss periods.

Where N = Number of periods
Where R_I = Return for period I
Where L_I = 0 (IF $R_I \geq 0$) or R_I (IF $R_I < 0$)
N_L = Number of periods that $R_I < 0$

N

$$\textbf{Average Loss} = \left(\sum_{I=1} L_I \right) \div N_L$$

Compound (Geometric) Average Return - The geometric mean is the monthly average return that assumes the same rate of return every period to arrive at the equivalent compound growth rate reflected in the actual return data. In other words, the geometric mean is the monthly average return that, if applied each period, would give you a final Vami (growth) index that is equivalent to the actual final Vami index for the return stream you are considering. In PerTrac, compound quarterly and annualized returns are calculated using the compound monthly return as a base.

Where N = Number of periods
Where Vami (0) = 1000

$$\textbf{Compound Monthly ROR} = \left(\text{Vami}_N \div \text{Vami}_0 \right)^{\mathbf{1/N}} - 1$$

$$\textbf{Compound Quarterly ROR} = \left(1 + \text{Compound Monthly ROR} \right)^{\mathbf{3}} - 1$$

$$\textbf{Compound Annualized ROR} = \left(1 + \text{Compound Monthly ROR} \right)^{\mathbf{12}} - 1$$

Average Calculation (within the annual returns table) – The average displays a simple average of the displayed statistic; however partial years are considered within the calculation. For example: a fund that has annual returns of 2002 (12.56%), 2003 (2.42%) and a partial 2004 year of 2 months (2.61%) would have an average Annual Return of 8.12%. The result can be achieved by adding (12.56%+2.42%+2.61%) and dividing by 2.167. The denominator of 2.167 was a result of 2 whole years and one sixth of a year (1+1+.1667).

Standard Deviation - Standard Deviation measures the dispersal or uncertainty in a random variable (in this case, investment returns). It measures the degree of variation of returns around the mean (average) return. The higher the volatility of the investment returns, the higher the standard deviation will be. For this reason, standard deviation is often used as a measure of investment risk.

Where R_I = Return for period I
Where M_R = Mean of return set R
Where N = Number of Periods

$$M_R = \left(\sum_{I=1}^{N} R_I \right) \div N$$

$$\textbf{Standard Deviation} = \left(\sum_{I=1}^{N} (R_I - M_R)^{\mathbf{2}} \div (N-1) \right)^{1/2}$$

Annualized Standard Deviation

$$\textbf{Annualized Standard Deviation} = \text{Monthly Standard Deviation} \times (12)^{1/2}$$

$$\textbf{Annualized Standard Deviation *} = \text{Quarterly Standard Deviation} \times (4)^{1/2}$$

* Quarterly Data

Gain Standard Deviation - Similar to standard deviation, except this statistic calculates an average (mean) return for only the periods with a **gain** and then measures the variation of only the **gain** periods around this gain mean. This statistic measures the volatility of upside performance.

Where N = Number of Periods
Where R_I = Return for period I
Where M_G = Gain Mean
Where $G_I = R_I$ (IF $R_I \geq 0$) or 0 (IF $R_I < 0$)
Where $GG_I = R_I - M_G$ (IF $R_I \geq 0$) or 0 (IF $R_I < 0$)
N_G = Number of periods that $R_I \geq 0$

$$M_G = \left(\sum_{I=1}^{N} G_I \right) \div N_G$$

$$\textbf{Gain Deviation} = \left(\sum_{I=1}^{N} (GG_I)^2 \div (N_G - 1) \right)^{1/2}$$

Loss Standard Deviation - Similar to standard deviation, except this statistic calculates an average (mean) return for only the periods with a **loss** and then measures the variation of only the **losing** periods around this loss mean. This statistic measures the volatility of downside performance.

Where N = Number of Periods
Where R_I = Return for period I
Where M_L = Loss Mean
Where $L_I = R_I$ (IF $R_I < 0$)or 0 (IF $R_I \geq 0$)
Where $LL_I = R_I - M_L$ (IF $R_I < 0$) or 0 (IF $R_I \geq 0$)
N_L = Number of periods that $R_I < 0$

$$M_L = \left(\sum_{I=1}^{N} L_I \right) \div N_L$$

$$\textbf{Loss Deviation} = \left(\sum_{I=1}^{N} (LL_I)^2 \div (N_L - 1) \right)^{1/2}$$

Downside Deviation - Similar to the loss standard deviation except the downside deviation considers only returns that fall below a defined Minimum Acceptable Return (MAR) rather then the arithmetic mean. For example, if the MAR is assumed to be 10%, the downside deviation would measure the variation of each period that falls below 10%. (The loss standard deviation, on the other hand, would take only losing periods, calculate an **average** return for the losing periods, and then measure the variation between each losing return and the losing return **average**). In PerTrac, there are 3 downside deviation calculations, each using a different value for the MAR: 1)Uses a MAR which is defined by the user on the **Preferences** screen, 2) Uses the Sharpe risk free rate (which can also be defined in **Preferences**) as the MAR, and 3) uses zero as the MAR.

Where R_I = Return for period I

Where N = Number of Periods
Where R_{MAR} = Period Minimum Acceptable Return
Where $L_I = R_I - R_{MAR}$ (IF $R_I - R_{MAR} < 0$)or 0 (IF $R_I - R_{MAR} \geq 0$)

$$\textbf{Downside Deviation} = \left(\left(\sum_{I=1}^{N} (L_I)^2 \right) \div N \right)^{1/2}$$

Semi Deviation

Where R_I = Return for period I
Where N = Number of Periods
Where M = Period Arithmetic Mean
Where $L_I = R_I - M$ (IF $R_I - M < 0$)or 0 (IF $R_I - M \geq 0$)
Where N_L = Number of Periods where $R_I - M < 0$

$$\textbf{Semi Deviation} = \left(\left(\sum_{I=1}^{N} (L_I)^2 \right) \div (N_L - 1) \right)^{1/2}$$

Sharpe Ratio - A return/risk measure developed by William Sharpe. Return (numerator) is defined as the incremental average return of an investment over the risk free rate. Risk (denominator) is defined as the standard deviation of the investment returns. In PerTrac, the user enters the value for the risk free rate.

Where R_I = Return for period I
Where M_R = Mean of return set R
Where N = Number of Periods
Where SD = Period Standard Deviation
Where R_{RF} = Period Risk Free Return

$$M_R = \left(\sum_{I=1}^{N} R_I \right) \div N$$

$$SD = \left(\sum_{I=1}^{N} (R_I - M_R)^2 \div (N - 1) \right)^{1/2}$$

$$\textbf{Sharpe Ratio} = (M_R - R_{RF}) \div SD$$

Annualized Sharpe Ratio

$$\textbf{Annualized Sharpe} = \text{Monthly Sharpe} \times (12)^{1/2}$$

$$\textbf{Annualized Sharpe *} = \text{Quarterly Sharpe} \times (4)^{1/2}$$ * Quarterly Data

Sortino Ratio - This is another return/risk ratio developed by Frank Sortino. Return (numerator) is defined as the incremental compound average period return over a Minimum Acceptable Return (MAR). Risk (denominator) is defined as the Downside Deviation below a Minimum Acceptable Return (MAR). Just as with the Downside Deviation calculation, PerTrac calculates the Sortino using 3 different values for the MAR: 1) a MAR defined by the user under **Preferences**, 2) the Sharpe ratio risk free rate (also set under **Preferences**), and 3) zero.

Where R_I = Return for period I

Where N = Number of Periods

Where R_{MAR} = Period Minimum Acceptable Return

Where DD_{MAR} = Downside Deviation

Where $L_I = R_I - R_{MAR}$ (IF $R_I - R_{MAR} < 0$)or 0 (IF $R_I - R_{MAR} \geq 0$)

$$DD_{MAR} = \left(\left(\sum_{I=1}^{N} (L_I)^2 \right) \div N \right)^{1/2}$$

$$\textbf{Sortino Ratio} = \left(\text{Compound Period Return} - R_{MAR} \right) \div DD_{MAR}$$

Annualized Sortino Ratio

$$\textbf{Annualized Sortino} = \text{Monthly Sortino} \times (12)^{1/2}$$

$$\textbf{Annualized Sortino*} = \text{Quarterly Sortino} \times (4)^{1/2}$$

* Quarterly Data

Skewness - Skewness characterizes the degree of asymmetry of a distribution around its mean. Positive skewness indicates a distribution with an asymmetric tail extending toward more positive values. Negative skewness indicates a distribution with an asymmetric tail extending toward more negative values.

Where N = Number of Periods

Where R_I = Return for period I

Where M_R = Mean of return set R

Where SD = Period Standard Deviation

$$M_R = \left(\sum_{I=1}^{N} R_I \right) \div N$$

$$SD = \left(\sum_{I=1}^{N} (R_I - M_R)^2 \div (N-1) \right)^{1/2}$$

$$\textbf{Skewness} = \left(N \div ((N-1)(N-2)) \right) \left(\sum_{I=1}^{N} (R_I - M_R) \div SD \right)^3$$

If there are fewer than three data points, or the sample standard deviation is zero, Skewness returns the N/A error value.

Kurtosis - Kurtosis characterizes the relative peakedness or flatness of a distribution compared with the normal distribution. Positive kurtosis indicates a relatively peaked distribution. Negative kurtosis indicates a relatively flat distribution.

Where N = Number of Periods
Where R_I = Return for period I
Where M_R = Mean of return set R
Where SD = Period Standard Deviation

$$M_R = \left(\sum_{I=1}^{N} R_I \right) \div N$$

$$SD = \left(\sum_{I=1}^{N} (R_I - M_R)^2 \div (N - 1) \right)^{1/2}$$

$$\textbf{Kurtosis} = \left\{ \left(N(N+1) \div ((N-1)(N-2)(N-3)) \right) \left(\sum_{I=1}^{N} (R_I - M_R) \div SD) \right)^4 \right\} - \left(3(N-1)^2 \div ((N-2)(N-3)) \right)$$

If there are fewer than four data points, or if the standard deviation of the sample equals zero, Kurtosis returns the N/A error value.

Calmar Ratio - This is a return/risk ratio. Return (numerator) is defined as the Compound Annualized Rate of Return over the last 3 years. Risk (denominator) is defined as the Maximum Drawdown over the last 3 years. If three years of data are not available, the available data is used. ABS is the Absolute Value.

$$\textbf{Calmar Ratio} = \text{Compound Annualized ROR} \div \text{ABS}\left(\text{Maximum Drawdown}\right)$$

Sterling Ratio - This is a return/risk ratio. Return (numerator) is defined as the Compound Annualized Rate of Return over the last 3 years. Risk (denominator) is defined as the Average Yearly Maximum Drawdown over the last 3 years less an arbitrary 10%. To calculate this average yearly drawdown, the latest 3 years (36 months) is divided into 3 separate 12-month periods and the maximum drawdown is calculated for each. Then these 3 drawdowns are averaged to produce the Average Yearly Maximum Drawdown for the 3 year period. If three years of data are not available, the available data is used.

Where D1 = Maximum Drawdown for first 12 months
Where D2 = Maximum Drawdown for next 12 months
Where D3 = Maximum Drawdown for latest 12 months

Average Drawdown = (D1 + D2 + D3) $\div$ 3

$$\textbf{Sterling Ratio} = \text{Compound Annualized ROR} \div \text{ABS}\left(\left(\text{Average Drawdown - 10\%}\right)\right)$$

Drawdown - A Drawdown is any losing period during an investment record. It is defined as the percent retrenchment from an equity peak to an equity valley. A Drawdown is in effect from the time an equity retrenchment begins until a new equity high is reached. (i.e. In terms of time, a drawdown encompasses both the period from equity peak to equity valley (**Length**) and the time from the equity valley to a new equity high (**Recovery**).

Maximum Drawdown is simply the largest percentage drawdown that has occurred in any investment data record.

The Drawdown Table in PerTrac provides a comprehensive list of all drawdowns in the historical performance record ranked from largest to smallest.

Gain to Loss Ratio - This is a simple ratio of the average gain in a gain period divided by the average loss in a losing period. Periods can be monthly or quarterly depending on the data frequency.

Gain/Loss Ratio $= \text{ABS}\left(\text{Average Gain in Gain Period} \div \text{Average Loss in Loss Period}\right)$

$ Profit to Loss Ratio - This ratio combines the Gain to Loss Ratio with the ratio of the percentage of profitable periods to the percentage of losing periods. Since this ratio considers both the average size and the frequency of winning and losing periods, it tells you the historical ratio of dollars earned in the investment to dollars lost. For example, a $ Profit to Loss Ratio of 2.5 means that, historically, the investment earned $2.50 of profit for each $1.00 of risk taken.

$ Profit/Loss Ratio $= \left(\%\ \text{Profitable Periods} \div \%\ \text{Losing Periods}\right) \times \text{Gain to Loss Ratio}$

Losing Streak - The percentage change between the maximum equity high (high water mark) and the latest month’s equity. If the latest month’s equity is a high water mark then 0% is displayed. This statistic displays the percentage a manager needs to overcome in order to start accruing any fees based on a high water mark.

Correlation Analysis - All of the following correlation related statistics use the following variables:

Where R_I = The return of the independent variable for period I
Where RD_I = The return of the dependent variable for period I
Where RD_{Iest} = The return of the estimated dependent variable for period I.
This number is achieved using the formula $(RD_{Iest} = \text{Alpha} + \text{Beta}(R_I))$
Where M_R = The mean return of the independent variable
Where M_{RD} = The mean return of the dependent variable
Where N = Number of Periods

Beta - Beta is the slope of the regression line. Beta measures the risk of a particular investment relative to the market as a whole (the “market” can be any index or investment you specify). It describes the sensitivity of the investment to broad market movements. For example, in equities, the stock market (the independent variable) is assigned a beta of 1.0. An investment which has a beta of .5 will tend to participate in broad market moves, but only half as much as the market overall.

$$\textbf{Beta} = \left(\sum_{I=1}^{N} (R_I - M_R)(RD_I - M_{RD})\right) \div \left(\sum_{I=1}^{N} (R_I - M_R)^2\right)$$

Alpha - Alpha is a measure of value added. It is the Y intercept of the regression line.

$$\textbf{Alpha} = M_{RD} - \text{Beta} \times M_R$$

***Annualized Alpha* –** Annualized Alpha is the annualized value of Alpha.

$$\textbf{Annualized Alpha} = ((1 + \text{Alpha})^{12} - 1 \qquad \text{(Monthly Data)}$$

$$\textbf{Annualized Alpha} = ((1 + \text{Alpha})^{4} - 1 \qquad \text{(Quarterly Data)}$$

Correlation and Correlation Coefficient - Correlation measures the extent of linear association of two variables. The Coefficient of Determination (R^2) is a measure of how well the regression line fits the data (variation explained by the regression line). Unexplained variation is simply 1- R^2 .

Correlation Coefficient (r)
Where S_{XY} = Sample Covariance
Where S_X = Standard deviation of independent variable
Where S_Y = Standard deviation of dependent variable

$$S_{XY} = \left(\sum_{I=1}^{N} (R_I - M_R)(RD_I - M_{RD})\right) \div \left(N - 1\right)$$

$$S_X = \left(\sum_{I=1}^{N} (R_I - M_R)^2 \div (N - 1)\right)^{1/2}$$

$$S_Y = \left(\sum_{I=1}^{N} (RD_I - M_{RD})^2 \div (N - 1)\right)^{1/2}$$

$$\textbf{Correlation Coefficient} = S_{XY} \div (S_X \times S_Y)$$

Coefficient of Determination (r^2)
Where Y_I = Alpha + Beta $\times$ R_I

$$\textbf{Coefficient of Determination} = \left(\sum_{I=1}^{N} (Y_I - M_{RD})^2\right) \div \left(\sum_{I=1}^{N} (RD_I - M_{RD})^2\right)$$

Standard Error – This statistic is measuring the degree of variability of the actual Y-values (RD_I) relative to the estimated Y-values (RD_{Iest}) from a regression equation. The statistic is often referred to as the standard error of the estimate (SEE), standard error of the residual or standard error of the regression. The (SEE) gauges the "fit" of the regression line. The smaller the standard error, the better the fit. This is not the standard error of the mean, beta or alpha coefficients.

$$\textbf{SEE} = \left(\left(\sum_{I=1}^{N} (RD_I - RD_{I\,est})^2\right) \div (N-2)\right)^{1/2}$$

T-Stat - The t-stat in Pertrac is testing the hypothesis that the slope coefficient (Beta) is significantly different than zero at a 5% level of significance (95% confidence level). An absolute value greater then 1.96

indicates the beta is meaningful. The t-stat calculation is the beta divided by the beta standard error. The beta standard error is not displayed in Pertrac.

T-Stat = Beta $\div$ Beta Standard Error

Beta Std. Error = $\left(1 \div \left(\sum_{I=1}^{N} (R_I)^2\right) - \left(N*(M_R)^2\right)\right)^{1/2}$

Tracking Error (Annualized) - Tracking Error is a measure of the unexplained portion of an investments performance relative to a benchmark. Annualized Tracking Error is measured by taking the square root of the average of the squared deviations between the investment's returns and the benchmark's returns, then multiplying the result by the square root of 12.

Tracking Error = $\left(\left(\sum_{I=1}^{N} (R_I - RD_I)^2 \div (N-1)\right)^{1/2}\right) \times 12^{1/2}$

Treynor Ratio – The Treynor Ratio, developed by Jack Treynor, is similar to the Sharpe Ratio, except that it uses Beta as the volatility measurement. Return (numerator) is defined as the incremental average return of an investment over the risk free rate. Risk (denominator) is defined as the Beta of the investment returns relative to a benchmark. In PerTrac, the user enters the value for the risk free rate.

Where M_R = Annualized Return of Investment
Where R_{RF} = Annualized Risk Free Return

Treynor Ratio = $(M_R - R_{RF}) \div$ **Beta**

Jensen Alpha - The Jensen Alpha, developed by Michael Jensen, quantifies the extent to which an investment has added value relative to a benchmark. The Jensen Alpha is equal to the Investment's average return in excess of the risk free rate minus the Beta times the Benchmark's average return in excess of the risk free rate. In PerTrac, the user enters the value for the risk free rate.

Where R_I = Benchmark Return for period I
Where RD_I = Return for period I
Where M_R = Mean of return set R (Benchmark)
Where M_{RD} = Mean of return set RD
Where N = Number of Periods
Where R_{RF} = Period Risk Free Return

$$M_R = \left(\sum_{I=1}^{N} R_I\right) \div N$$

$$M_{RD} = \left(\sum^{N} RD_I\right) \div N$$

I=1

Jensen Alpha = $\left(M_{RD} - R_{RF} \right)$ **- Beta** ´ $\left(M_{R} - R_{RF} \right)$

Active Premium - A measure of the Investment’s annualized return minus the Benchmark’s annualized return.

Active Premium = **Investment’s annualized return - Benchmark’s annualized return.**

Information Ratio - The Information Ratio is the Active Premium divided by the Tracking Error. This measure explicitly relates the degree by which an Investment has beaten the Benchmark to the consistency by which the Investment has beaten the Benchmark.

Information Ratio = Active Premium ¸ Tracking Error

Up Capture - The Up Capture Ratio is a measure of the Investment’s compound return when the Benchmark was up divided by the Benchmark’s compound return when the Benchmark was up. The greater the value, the better.

Where R_I = Return for period I
Where RD_I = Benchmark Return for period I
Where N = Number of Periods
Where $L_I = R_I$ (IF RD_I ³ 0) or 0 (IF $RD_I < 0$)
Where $LD_I = R_{DI}$ (IF RD_I ³ 0) or 0 (IF $RD_I < 0$)

T = $\left((1+L_0)$ ´ $(1+L_1)$ ´ **...** ´ $(1+L_N)\right)$ -1
TD = $\left((1+LD_0)$ ´ $(1+LD_1)$ ´ **...** ´ $(1+LD_N)\right)$ -1

Up Capture = T ¸ TD

Down Capture - The Down Capture Ratio is a measure of the Investment’s compound return when the Benchmark was down divided by the Benchmark’s compound return when the Benchmark was down. The smaller the value, the better.

Where R_I = Return for period I
Where RD_I = Benchmark Return for period I
Where N = Number of Periods
Where $L_I = R_I$ (IF $RD_I < 0$) or 0 (IF RD_I ³ 0)
Where $LD_I = RD_I$ (IF $RD_I < 0$) or 0 (IF RD_I ³ 0)

T = $\left((1+L_0)$ ´ $(1+L_1)$ ´ **...** ´ $(1+L_N)\right)$ -1
TD = $\left((1+LD_0)$ ´ $(1+LD_1)$ ´ **...** ´ $(1+LD_N)\right)$ -1

Down Capture = T $\div$ TD

Up # - The Up Number Ratio is a measure of the number of periods that the Investment was up, when the Benchmark was up, divided by the number of periods that the Benchmark was up. The larger the ratio, the better.

Where R_I = Return for period I
Where RD_I = Benchmark Return for period I
Where N = Number of Periods
Where L_I = **1** (IF $R_I \geq 0$ **AND** $RD_I \geq 0$) **ELSE** 0
Where LD_I = **1** (IF $RD_I \geq 0$) **ELSE** 0

$$T = \left(\sum_{I=1}^{N} L_I\right)$$

$$TD = \left(\sum_{I=1}^{N} LD_I\right)$$

Up Number Ratio = T $\div$ TD

Down # - The Down Number Ratio is a measure of the number of periods that the Investment was down when the Benchmark was down, divided by the number of periods that the Benchmark was down. The smaller the ratio, the better.

Where R_I = Return for period I
Where RD_I = Benchmark Return for period I
Where N = Number of Periods
Where L_I = **1** (IF $R_I < 0$ **AND** $RD_I < 0$) **ELSE** 0
Where LD_I = **1** (IF $RD_I < 0$) **ELSE** 0

$$T = \left(\sum_{I=1}^{N} L_I\right)$$

$$TD = \left(\sum_{I=1}^{N} LD_I\right)$$

Down Number Ratio = T $\div$ TD

Up % - **The Up Percentage Ratio** is a measure of the number of periods that the Investment outperformed the Benchmark when the Benchmark was up, divided by the number of periods that the benchmark was up. The larger the ratio, the better.

Where R_I = Return for period I
Where RD_I = Benchmark Return for period I
Where N = Number of Periods
Where L_I = **1** (IF R_I ³ RD_I **AND** RD_I ³ 0) **ELSE** 0
Where LD_I = **1** (IF RD_I ³ 0) **ELSE** 0

$$T = \left(S_{I=1}^{N} L_I\right)$$

$$TD = \left(S_{I=1}^{N} LD_I\right)$$

Up Percentage Ratio = T ¸ TD

Down % - **The Down Percentage Ratio** is a measure of the number of periods that the Investment outperformed the Benchmark when the Benchmark was down, divided by the number of periods that the benchmark was down. The larger the ratio, the better.

Where R_I = Return for period I
Where RD_I = Benchmark Return for period I
Where N = Number of Periods
Where L_I = **1** (IF R_I ³ RD_I **AND** $RD_I < 0$) **ELSE** 0
Where LD_I = **1** (IF $RD_I < 0$) **ELSE** 0

$$T = \left(S_{I=1}^{N} L_I\right)$$

$$TD = \left(S_{I=1}^{N} LD_I\right)$$

Down Percentage Ratio = T ¸ TD

% Gain - **The Percent Gain Ratio** is a measure of the number of periods that the Investment was up divided by the number of periods that the Benchmark was up. The larger the ratio, the better.

Where R_I = Return for period I

Where RD_I = Benchmark Return for period I

Where N = Number of Periods

Where L_I = **1** (IF $R_I \geq 0$) **ELSE** 0

Where LD_I = **1** (IF $RD_I \geq 0$) **ELSE** 0

$$T = \left(\sum_{I=1}^{N} L_I\right)$$

$$TD = \left(\sum_{I=1}^{N} LD_I\right)$$

Percent Gain Ratio = T ÷ TD