SHARPE RATIO

Reference: -- http://www.stanford.edu/~wfsharpe/art/sr/sr.htm and <http://en.wikipedia.org/wiki/Sharpe_ratio>

It’s not enough to put in a reference. If something is a direct quote, you should put quotation marks around it. There is no problem in doing this. If the passage quoted is long, you can also say. The following section is quoted directly from source x.

Definition of Sharpe Ratio

The **Sharpe ratio** or **Sharpe index** or **Sharpe measure** or **reward-to-variability ratio** is a measure of the excess return (or Risk Premium) per unit of risk in an investment asset or a trading strategy, named after William Forsyth Sharpe.

The Sharpe ratio is used to characterize how well the return of an asset compensates the investor for the risk taken, the higher the Sharpe ratio numbers the better. When comparing two assets each with the expected return against the same benchmark with return, the asset with the higher Sharpe ratio gives more return for the same risk. Investors are often advised to pick investments with high Sharpe ratios. However like any mathematical model it relies on the data being correct

**Theory Used for Calculation**

### THE RATIO

Most performance measures are computed using historic data but justified on the basis of predicted relationships. Practical implementations use ex post results while theoretical discussions focus on ex ante values. Implicitly or explicitly, it is assumed that historic results have at least some predictive ability.

For some applications, it suffices for future values of a measure to be related monotonically to past values -- that is, if fund X had a higher historic measure than fund Y, it is assumed that it will have a higher future measure. For other applications the relationship must be proportional - - that is, it is assumed that the future measure will equal some constant (typically less than 1.0) times the historic measure.

To avoid ambiguity, we define here both ex ante and ex post versions of the Sharpe Ratio, beginning with the former. With the exception of this section, however, we focus on the use of the ratio for making decisions, and hence are concerned with the ex ante version. The important issues associated with the relationships (if any) between historic Sharpe Ratios and unbiased forecasts of the ratio are left for other expositions.

Throughout, we build on Markowitz' mean-variance paradigm, which assumes that the mean and standard deviation of the distribution of one-period return are sufficient statistics for evaluating the prospects of an investment portfolio. Clearly, comparisons based on the first two moments of a distribution do not take into account possible differences among portfolios in other moments or in distributions of outcomes across states of nature that may be associated with different levels of investor utility.

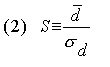
When such considerations are especially important, return mean and variance may not suffice, requiring the use of additional or substitute measures. Such situations are, however, beyond the scope of this article. Our goal is simply to examine the situations in which two measures (mean and variance) can usefully be summarized with one (the Sharpe Ratio).

#### The Ex Ante Sharpe Ratio

Let Rf represent the return on fund F in the forthcoming period and RB the return on a benchmark portfolio or security. In the equations, the tildes over the variables indicate that the exact values may not be known in advance. Define d, the differential return, as:

http://www.stanford.edu/%7Ewfsharpe/art/sr/sr_1.gif

Let d-bar be the expected value of d and sigmad be the predicted standard deviation of d. The ex ante Sharpe Ratio (S) is:



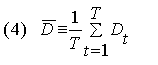
In this version, the ratio indicates the expected differential return per unit of risk associated with the differential return.

#### The Ex Post Sharpe Ratio

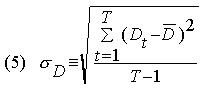
Let RFt be the return on the fund in period t, RBt the return on the benchmark portfolio or security in period t, and Dt the differential return in period t:

http://www.stanford.edu/%7Ewfsharpe/art/sr/sr_3.gif

Let D-bar be the average value of Dt over the historic period from t=1 through T:



and sigmaD be the standard deviation over the period [1](http://www.stanford.edu/%7Ewfsharpe/art/sr/SR.htm#fn1):



The ex post, or historic Sharpe Ratio (Sh) is:

http://www.stanford.edu/%7Ewfsharpe/art/sr/sr_6.gif

In this version, the ratio indicates the historic average differential return per unit of historic variability of the differential return.

**SQL CALCULATION**

We will be using Post Sharpe ratio (in red above) Yes, this is MUCH better.

Tables we will use: -- stock\_history, trading\_dates

Step 1) get trading dates

SELECT t.Date, NextDate = (SELECT MIN(Date) FROM trading\_dates WHERE Date > t.Date) INTO #trading\_dates

FROM trading\_dates t

Step 2) Calculate Dt as given in the formula and considering .039 as a benchmark return (T-Bill). BenchMark Return may vary. We are keeping it simple.

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SELECT t.Date,

Dt = (sb.CloseAt / sa.CloseAt -1) - .039

INTO #returns

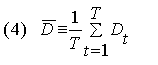
FROM #trading\_dates t

INNER JOIN stock\_history sa ON sa.StockID=53334 and sa.Date = t.Date

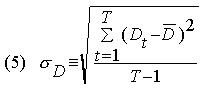
INNER JOIN stock\_history sb ON sb.StockID = 53334 AND sb.Date = t.NextDate

ORDER BY Type t.Date

Step 3) Calculate average, standard deviation and finally Sharpe ratio



D bar is average



Sigma D is Standard Deviation

http://www.stanford.edu/%7Ewfsharpe/art/sr/sr_6.gif

Sh is shrape ratio

SELECT t.Date, Sharpe = avg(excessreturn)/stdev(excessreturn)

FROM #trading\_dates t

INNER JOIN #returns r ON r.Date BETWEEN DATEADD(YEAR, -1, t.Date) AND t.Date

GROUP BY t.Date

order by t.Date

---------------------------------------------------------END----------------------------------------------------------------------------

About to add: -- Scaling, time taken and tuning work.