What is Sharpe Ratio?

A ratio developed by Nobel laureate William F. Sharpe to measure risk-adjusted performance. The Sharpe ratio is calculated by subtracting the risk-free rate - such as that of the 10-year U.S. Treasury bond - from the rate of return for a portfolio and dividing the result by the standard deviation of the portfolio returns. The Sharpe ratio formula

$$= \frac{\bar{r}_p - r_f}{\sigma_p}$$

Where:

$\bar{r}_p$ = Expected porfolio return

r_f = Risk free rate

is: σ_p = Portfolio standard deviation

The Sharpe ratio tells us whether a portfolio's returns are due to smart investment decisions or a result of excess risk. This measurement is very useful because although one portfolio or fund can reap higher returns than its peers, it is only a good investment if those higher returns do not come with too much additional risk. The greater a portfolio's Sharpe ratio, the better its risk-adjusted performance has been. A negative Sharpe ratio indicates that a risk-less asset would perform better than the security being analyzed.[1]

Here is how we calculate it:

1) Open Excel and enter all historical portfolio values found here http://www.stocktrak.com/private/account/graphportfolio.aspx (click on Historical Portfolio Values)
2) Calculate daily portfolio value returns

Days	Hist. Portfolio Values	Return
1	$1,002,109.69	0.07%
2	$1,002,804.38	0.00%
3	$1,002,804.38	0.02%
4	$1,002,968.76	-0.35%
5	$999,500.95	0.60%
6	$1,005,498.14	1.74%
7	$1,023,029.42	0.60%
8	$1,029,213.20	-0.03%
9	$1,028,899.47	0.00%
10	$1,028,899.47	0.00%
11	$1,028,899.47	-0.06%
12	$1,028,263.28	-0.11%
13	$1,027,107.05	0.02%
14	$1,027,358.82	0.84%
15	$1,035,969.58	-2.34%
16	$1,011,775.84	0.00%
17	$1,011,775.84	0.00%
18	$1,011,775.84	0.21%
19	$1,013,882.12	0.79%
20	$1,021,886.38	1.74%
21	$1,039,668.71	1.22%
22	$1,052,326.54	-2.12%
23	$1,030,042.65	0.00%
24	$1,030,042.65	0.00%
25	$1,030,042.65	2.10%
26	$1,051,649.98	6.23%
27	$1,117,159.01	-0.54%
28	$1,111,144.16	1.16%
29	$1,124,070.89	-1.16%
30	$1,111,052.62	

$$\frac{1,002,804.38}{1,002,109.69} - 1 = 0.07\%$$

The last daily return will be empty because we need the next day's value to calculate it

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[1] Explanation provided by Investopedia

3) Calculate the average return

$$\frac{\textbf{Sum(daily returns)}}{\textbf{(number daily returns)}} = \frac{10.64\%}{29} = 0.367\%$$

4) Calculate the geometric mean

Get the return between the last portfolio value and first portfolio then calculate the nth root (number of daily returns) and subtract 1.

$$\left(\sqrt[29]{\left(\frac{1111052.62}{1002109.69}\right)}\right) - 1 = 0.3565\%$$

5) Calculate the expected (annualized) portfolio return

Now that we have the geometric mean, we multiply by 365 to get the annualized portfolio return.

$$0.3565\% \times 365 = 130.1216\%$$

6) For the other part of the numerator we just subtract the risk free rate to our annualized portfolio return, the risk free rate used is 3%.

$$130.1216\% - 3\% = 127.1216\%$$

7) To calculate the denominator first we calculate the standard deviation

Here we use the Excel formula giving the range of daily portfolio returns
        =STDEVPA(range)

In our example the standard deviation is 0.01462

Then we annualize the standard deviation by multiplying by the square root of 365 days which is 19.1049

$$0.01462 \times 19.1049 = 0.2793$$

8) The sharpe ratio for this example is

$$\frac{127.1216\%}{0.2793} = 4.55$$