Answer on Question #44236, Math, Statistics and Probability

3.27 The Morningstar Top Fund lists at the Morningstar.com website give the mean yearly return and the standard deviation of the returns for each of the listed funds. As given by Morningstar.com on March 17, 2005, the RS Internet Age Fund has a mean yearly return of 10.93 percent with a standard deviation of 41.96 percent; the Franklin Income A fund has a mean yearly return of 13 percent with a standard deviation of 9.36 percent; the Jacob Internet fund has a mean yearly return of 34.45 percent with a standard deviation of 41.16 percent.

a. For each mutual fund, find an interval in which you would expect 95.44 percent of all yearly returns to fall. Assume returns are normally distributed.

b. Using the intervals you computed in part a, compare the three mutual funds with respect to average yearly returns and with respect to variability of returns.

c. Calculate the coefficient of variation for each mutual fund, and use your results to compare the funds with respect to risk. Which fund is riskier?

Solution.

a. The Empirical rule for a normally distributed variable state:
"If a variable has mean μ and standard deviation σ and is described by a normal curve, then 95.44 percent of the variable measurements are within (plus or minus) two standard deviations of the mean and thus lie in the interval $[\mu - 2\sigma;\ \mu + 2\sigma] = [\mu \pm 2\sigma]$"
RS Internet Age Fund: $[-72.99; 94.85]$.
Franklin Income A fund: $[-5.72; 31.72]$.
Jacob Internet fund: $[-47.87; 116.77]$.

b. We estimate that 95.44 percent of of all yearly returns in RS Internet Age Fund will equal between -72.99 percents and 94.85 percents.
We estimate that 95.44 percent of all yearly returns in RS Internet Franklin Income A fund will equal between -5.72 percents and 31.72 percents.
We estimate that 95.44 percent of all yearly returns in Jacob Internet fund will equal between -47.87 percents and 116.77 percents.
In each case the interval is large, so yearly return won't be close to mean yearly return.

c. The coefficient of variation (CV) is defined as the ratio of the standard deviation σ to the mean μ multiplied by 100.
RS Internet Age Fund: $c_v = \frac{41.96}{10.93} \cdot 100 \approx 383.9.$
Franklin Income A fund: $c_v = \frac{9.36}{13} \cdot 100 = 72.$
Jacob Internet fund: $c_v = \frac{41.16}{34.45} \cdot 100 \approx 119.48.$
A lower coefficient of variation indicates a higher expected return with less risk.
Hence, the RS Internet Age Fund is the most riskier and the Franklin Income A fund is the less riskier.