1. Consider the following distribution of returns of a stock:

Year	Return = r
1	-10%
2	20%
3	30%

What is the geometric mean return of the stock over 3 years?

Answer:

$$(1 + r_g) = [\,(1 + r_1)\,(1 + r_2) \ldots (1 + r_T)]^{\frac{1}{T}}$$

$1 + r_g = [(0.9) * (1.2) * (1.3)]^{\frac{1}{3}} = 1.1198.$ So $r_g = 11.98\%$

2. Consider the following distribution of returns of a stock:

Year	Return = r
1	-10%
2	20%
3	30%

What is the arithmetic mean return of the stock over 3 years?

Answer:

The arithmetic average of n returns is given by $(r_1 + r_2 + \ldots + r_n)/n$

$$r_a = \frac{-10 + 20 + 30}{3} = 13.33\%$$

3. If you wanted to measure past performance of an investment, you would prefer to look at:

   a. The arithmetic average return over the period of interest
   b. The geometric average return over the period of interest
   c. Both arithmetic and geometric average returns over the period of interest
   d. The standard deviation of the returns over the period of interest

Answer:

The correct answer is b.

The geometric average return tells us about the actual performance over the past sample period. It is the rate of return that would compound over the period to the same terminal value as the one obtained from the sequence of actual returns.

4. In which of the following cases you should take into account compounding?

    a. When you calculate the arithmetic average return
    b. When you calculate the volatility of an investment
    c. When you calculate both arithmetic and geometric average returns
    d. When you calculate the geometric average return

    Answer:

    The correct answer is d.

    Arithmetic and geometric average returns do not both take into account compounding. Geometric average return represents the average holding period return that would compound over the period to yield the same terminal value as the one obtained from the sequence of actual returns.

5. If you want to have an indication of the expected rate of return for an investment, you would prefer to look at:

    a. The arithmetic average return over the period of interest
    b. The geometric average return over the period of interest
    c. Both arithmetic and geometric average returns over the period of interest
    d. The standard deviation of the returns over the period of interest

    Answer:

    The correct answer is a.
    The arithmetic mean is an unbiased estimate of future expected returns.