

#### 6-1

Historical return is the actual return that an investment has produced in the past, based on recorded data. Expected return, on the other hand, is a forecast or estimate of the return that an investor anticipates in the future, often based on probabilities or assumptions.

#### 6-2

An asset only needs to be held for a single period no matter how short in order to calculate a return. The length of the holding period can vary (days, months, or years), but a return can be computed as long as there is a beginning value and an ending value.

#### 6-3

The two main components of return are income (such as dividends or interest) and capital gains (the change in price of the asset). Yes, either component can be negative—for example, if the asset's price falls, capital gains are negative; or if expenses exceed income, the income component could also be negative.

#### 6-4

Return refers to the gain or loss on an investment, expressed as a percentage of the initial investment. Holding period return is the total return earned from holding an asset over a specific time period, taking into account both income and capital gains during that period.

#### 6-5

The geometric mean return should be used when measuring returns over multiple periods, because it accounts for the compounding effect of gains and losses. It will always be less than or equal to the arithmetic mean unless all the returns are identical, since the geometric mean reflects the impact of variability and volatility over time.

#### 6-6

The arithmetic mean is best used when describing the expected return of a single period, such as the average return an investor might anticipate in any one year. It does not account for compounding, so it is more appropriate for short-term or one-period forecasts.

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The geometric mean will always be less than or equal to the arithmetic mean, with the difference growing as return variability increases. The arithmetic mean overstates long-term performance, while the geometric mean adjusts by incorporating the compounding of returns.

**6-8**

The equity risk premium is the additional return that investing in the stock market provides over a risk-free rate, such as government treasury securities. It represents the compensation investors demand for taking on the higher risk of equities compared to risk-free assets.

**6-9**

According to Table 6-6, common stocks such as the S&P 500 Composite have historically provided higher average returns than bonds, with an arithmetic mean return of 11.5 percent compared to 6.3 percent for Aaa corporate bonds and 5.8 percent for U.S. Treasury bonds. However, despite this superior performance, common stocks are considered more risky because their returns are far more volatile. This is reflected in their much higher standard deviation of 19.9 percent, versus 8.5 percent for corporate bonds and 9.2 percent for Treasury bonds. A higher standard deviation indicates greater variability and less predictability of outcomes, meaning investors in stocks face a wider range of possible results, including substantial short-term losses. In contrast, bonds provide lower average returns but are more stable and consistent over time. Therefore, while stocks offer the potential for higher long-term gains, they are deemed riskier due to the uncertainty and fluctuations associated with their returns.

**6-10** Market risk is the uncertainty from overall market movements affecting all securities, while business risk is the uncertainty tied to a specific company's operations. Interest rate risk is related to inflation risk because rising inflation often leads to higher interest rates, reducing bond prices and returns.

**6-11** General sources of risk: market risk, interest rate risk, inflation risk, and country risk. Specific sources of risk: business risk and financial risk of individual firms.

**6-12** Country risk is the possibility of loss due to political, economic, or financial instability in a nation. Canada's risk is generally low due to stable institutions, while Mexico's risk is higher because of greater political and economic uncertainty.

**6-13** If the yen weakens against the dollar, converting yen back to dollars will reduce your return, even if the stock gained value in yen.

**6-14** Risk is the chance that actual returns will differ from expected returns. Standard deviation measures how much returns deviate from the average, directly quantifying this uncertainty.

**6-15** The geometric mean reflects compounded growth over time, and a cumulative wealth index tracks the growth of \$1 invested. Both describe long-term wealth accumulation, with the geometric mean underlying the index's calculation.

6-16

**Common stocks vs. bonds:** Common stocks (S&P 500) returned more (11.5% arithmetic mean) than bonds (6.3% Aaa, 5.8% Treasury), but they are riskier because their standard deviation (19.9%) is much higher.

**Arithmetic vs. geometric mean:** Arithmetic mean shows average annual return (e.g., stocks 11.5%), while geometric mean shows compounded long-term return (stocks 9.6%), which is always lower due to volatility.

**Inflation:** Inflation averaged 3.1% (arithmetic), so real returns are lower once adjusted for inflation.

**6-17** The geometric mean annual inflation rate measures the compounded effect of inflation over time. By subtracting this rate from the geometric mean stock return, we can calculate the real, inflation-adjusted return for stocks between 1926–2010.

**6-18** The cumulative wealth index (CWI) for common stocks has two components: the initial investment and the compounded return. If one is known (e.g., initial investment), the other (final wealth) can be calculated using the geometric mean return, and vice versa.

**6-19** No. Higher return does not mean risk is proportional in the same way. Stocks are riskier because of greater volatility and uncertainty, but “twice the return” does not equal “twice the risk.”

**6-20** Yes. Cumulative wealth can be stated on an inflation-adjusted basis by using real returns instead of nominal returns, which reflects the actual purchasing power of the investment.

**6-21** Investors buy bonds because they provide more stability, lower volatility, and predictable income. Even though stocks return more in the long run, bonds reduce portfolio risk and preserve capital during market downturns.

**6-22** Yes. Even with strong long-term stock performance, over shorter horizons like 10 years, high volatility can cause negative average returns.

**6-23** Yes, if the investor prioritizes safety and liquidity above all else. Treasury bills are risk-free in nominal terms but will produce lower long-term returns and may not keep pace with inflation.

**6-24** Returns from gold are calculated the same way as other assets

Format = (ending price – beginning price + any income, though gold has none) ÷ beginning price.

**6-25** The claim is misleading. Even small differences in annual return rates compound significantly over long periods. Over 40 years, 6% grows much more than 5.5%, leading to a meaningful wealth gap.

**6-26** To double your money in 10 years, the implied return is about 7.2% per year (using the Rule of 72 or solving for compound annual growth rate).

**6-27** No, the claim is not feasible. Earning 25% a month compounded over 10 years would result in astronomical wealth, far beyond any realistic market performance. It is mathematically possible but practically impossible.

**6-28** The better option is **1% a month, compounded monthly**, because it yields about 12.68% annually. The alternative, 0.5% compounded semimonthly (24 periods), yields about 12.55% annually, which is slightly lower.