FIN 300

Stock Returns

Lecture 9

TOPICS COVERED

- Dollar Returns
- Percentage Returns
- Dividend Yield
- Capital Gains Yield
- Efficient Market Hypothesis
- Statistics

DOLLAR RETURNS

- Total gain above invested pricipal

$$\text{Dollar Return} = \text{Dividends} + \text{Capital Gains}$$

- Dividends: cash payments to shareholders
- Capital gains: price appreciation

EXAMPLE

You purchased a stock for $\$30$ one year ago. This year it's worth $\$38$ and it paid you a dividend of $\$0.50$ since you bought it. What is your dollar return?

$$\text{Dollar Return} = \$0.50 + \$38 - \$30 = \$8.50$$

PERCENTAGE RETURNS

- Dollar returns are less meaningful when we want to compare investments of different sizes
- Percent returns are equal to the dollar returns, scaled by the market value at the start of the period:

$$\text{Percent Returns} = \frac{\text{Dollar Returns}}{\text{Initial Market Value}}$$

$$R_1 = \frac{D_1 + P_1 - P_0}{P_0}$$

EXAMPLE

You purchased a stock for $\$30$ one year ago. This year it's worth $\$38$ and it paid you a dividend of $\$0.50$ since you bought it. What is your percent return?

$$R_1 = \frac{\$0.50 + \$38 - \$30}{\$30} = 0.283 = 28.3\%$$

DIVIDEND YIELD

- What return comes from dividend payments?
- Dividend yield is the dividend paid divided by the starting price

$$\text{Dividend Yield} = \frac{D_1}{P_0}$$

EXAMPLE

You purchased a stock for $\$30$ one year ago. This year it's worth $\$38$ and it paid you a dividend of $\$0.50$ since you bought it. What is your dividend yield?

$$\text{Dividend Yield} = \frac{\$0.50}{\$30} = 0.0167 = 1.67\%$$

CAPITAL GAINS YIELD

- What return comes from capital gains?
- Capital gains yield is the capital gains divided by the starting price

$$\text{Capital Gains Yield} = \frac{P_1 - P_0}{P_0}$$

EXAMPLE

You purchased a stock for $\$30$ one year ago. This year it's worth $\$38$ and it paid you a dividend of $\$0.50$ since you bought it. What is your capital gains yield?

$$\text{Capital Gains Yield} = \frac{\$38 - \$30}{\$30}$$
$$= 0.267 = 26.7\%$$

NOTE

PERCENT RETURN = DIVIDEND YIELD + CAPITAL GAINS YIELD

From our example

$$R = 28.33\%$$

$$Dividend\ Yield = 1.667\%$$

$$Capital\ Gains\ Yield = 26.667\%$$

EFFICIENT MARKET HYPOTHESIS

The Efficient Market Hypothesis states that stock prices (or any other prices in an efficient market) completely reflect all relevant and available information. This means that the returns to investors are only compensation for the financial risk that they are bearing. There is no "free-lunch".

The intuition behind the EMH is relatively straightforward: suppose you knew that the stock of a company was going to increase in value by 10% tomorrow. You would likely buy the stock today. If you continued to buy the stock today, this would cause price pressure (think supply and demand), which would increase the price.

RETURN STATISTICS

- Arithmetic Average
- Geometric Average
- Variance and Standard Deviation

ARITHMETIC AVERAGE

$$\text{Average}_{Arithmetic} = \frac{1}{N} \sum_{i=1}^{N} R_i$$

EXAMPLE

A stock had returns $10\%, 15\%, 4\%$ and 8% over the past 4 years. What was the arithmetic average return?

$$\begin{aligned}\text{Average}_{Arithmetic} &= \frac{10\% + 15\% + 4\% + 8\%}{4} \\ &= 9.25\%\end{aligned}$$

GEOMETRIC AVERAGE

What is the average *compound* return each year?

$$\text{Average}_{Geometric} = ((1 + R_1) \times (1 + R_2) \times \ldots \times (1 + R_N))^{\frac{1}{N}} - 1$$

EXAMPLE

A stock had returns $10\%, 15\%, 4\%$ and 8% over the past 4 years. What was the geometric average return?

$$\text{Average}_{Geo} = [(1.1) \times (1.15) \times (1.04) \times (1.08)]^{\frac{1}{4}}$$

$$= 0.0918 = 9.18\%$$

STANDARD DEVIATION

Standard deviation is the square root of the variance

EXAMPLE

A stock had returns $10\%, 15\%, 4\%$ and 8% over the past 4 years. What was the standard deviation of returns? [Remember $\bar{R} = 9.25\%$ from the earlier example.]

$$\sigma_R = \left[\frac{(0.1 - 0.0925)^2 + (0.15 - 0.0925)^2 + (0.04 - 0.0925)^2 + (0.08 - 0.0925)^2}{4 - 1}\right]$$

$$\sigma_R = 0.0457 = 4.57\%$$