Corporate Finance, Module 11: "Maximizing Net Present Value"

Homework Assignment

(The attached PDF file has better formatting.)

Answer the questions in the bulleted lists for each scenario below.

Scenario #1:

Let ϵ be a random variable with a normal distribution, mean 100, and standard deviation 5; ϵ_t is the value of ϵ on day t (t = 1, 2, 3, …)
Let S_t be the stock price for a certain stock on day t (t = 1, 2, 3, …); $S_t = \epsilon_t$

!   Is the market for this stock efficient? Explain why or why not.
!   What trading strategy would you use to beat the market for this stock? Assume you can buy stocks or sell them short with no trading expenses and the interest rate is zero. For instance, if the stock price on the past days is S_t for day t (t = 1, 2, 3, …, n-1), what trading rule would you use? Assume you have no *a priori* knowledge of the mean stock price.

Scenario #2:

Let ϵ be a random variable with a normal distribution, mean 0, and standard deviation 1; ϵ_t is the value of ϵ on day t (t = 1, 2, 3, …)
Let S_t be the stock price for a given stock on day t (t = 0, 1, 2, 3, …); S_0 = 100 and $S_t = S_{t-1} + \epsilon_t$ for t > 0.

!   Is the market for this stock efficient? Explain why or why not.
!   What trading strategy would you use to beat the market for this stock? Assume you can buy stocks or sell them short with no trading expenses and the interest rate is zero.

Scenario #3:

Let ϵ be a random variable with a normal distribution, mean 0, and standard deviation 1; ϵ_t is the value of ϵ on day t (t = 1, 2, 3, …)
Let S_t be the stock price for a given stock on day t (t = 0, 1, 2, 3, …); S_0 = 100 and $S_t = S_{t-1} \times (1+\epsilon_t)$ for t > 0.

!   Is the market for this stock efficient? Explain why or why not.
!   What is the expected rate of return on an investment in this stock?

Note: This exercise remains valid even if the stock price has a linear or exponential trend. An investment analyst may estimate the trend from past stock prices, and then check which scenario best models the difference of the actual stock price from the expected price. Unless the best model is scenario 3, a chart of past stock prices tells whether to buy or sell the stock.