Exercise Set: Risk and Return. Diversification.

Historical Risk and Return

| Date | Price | Dividend | |
|------------|-------|----------|--|
| 06/02/2008 | 79.91 | 0.40 | |
| 07/05/2008 | 84.55 | 0.40 | |
| 06/08/2008 | 65.40 | 0.40 | |
| 05/11/2008 | 49.55 | 0.40 | |
| 06/02/2009 | 72.63 | 0.42 | |
| 07/05/2009 | 79.08 | 0.42 | |
| 06/08/2009 | 57.41 | 0.42 | |
| 05/11/2009 | 66.65 | 0.42 | |
| 06/02/2010 | 74.22 | 0.44 | |

- 1) Calculate the quarterly return of this stock. What is the annualized quarterly return?
- 2) Calculate the quarterly standard deviation of this stock. What is the annualized quarterly standard deviation?

| Year | 1 | 2 | 3 | 4 |
|--------|-----|------|------|-----|
| Return | -4% | +28% | +12% | +4% |

- 3) What is the average annual return?
- 4) What is the variance of the stock's return?

Diversification

- 5) Consider the following two, completely separate, economies. The expected return and volatility of all stocks in both economies is the same. In the first economy, all stocks move together—in good times all prices rise together and in bad times they all fall together. In the second economy, stock returns are independent—one stock increasing in price has no effect on the prices of other stocks. Assuming you are risk-averse and you could choose one of the two economies in which to invest, which one would you choose?
- 6) Suppose the risk-free interest rate is 5%, and the stock market will return either 40% or -20% each year, with each outcome equally likely. Compare the following two investment strategies: (1) invest for one year in the risk-free investment, and one year in the market, or (2) invest for both years in the market.
 - a. Which strategy has the highest expected final payoff?
 - b. Which strategy has the highest standard deviation for the final payoff?
 - c. Does holding stocks for a longer period decrease your risk?