ECON 329

Worksheet on Diversification

The example in questions 1-3 was ~~stolen~~ lovingly borrowed from *A Random Walk Down Wall Street*, by Burton Malkiel, a book you should read if you want to understand the stock market.

1. Sunny Beach Resort (SBR) is a publically traded company. It operates a resort on a small but popular tropical island. The returns on SBR stock depend on the weather: if the tourist season is sunny, then SBR shares earn 10.0%. If the tourist season is rainy, then SBR shares earn only 2.5%. The probabilities of the two kinds of weather (or states of nature) are as follows:
   P(sunny season) = 0.6, P(rainy season) = 0.4

a. Compute the expected return to SBR shares as the probability-weighted average of the returns in each state.
b. Compute the range of possible returns (that is, the highest minus the lowest).

2. Umbrellas R Us (URU) is another publically traded company which operates on the same tropical island. If the season is rainy, URU shares earn 13.0%. If sunny, 3.0%. The probabilities of the two states are as given in question 1.

a. Compute the expected return to URU shares.
b. Compute the range of possible returns on URU stock.

3. Consider an equal-weighted portfolio of the two stocks. That is, the value of shares in each company makes up 50% of the value of the portfolio.

a. Compute the return this portfolio will experience in the event "sunny season."
b. Compute the return this portfolio will experience in the event "rainy season."
c. Compute the expected return on the portfolio as the probability-weighted average of your answers to parts a and b.
d. Compute the range of possible returns.

4. Stock market returns in Argentina and Belarus are 10% in good years and –2% in bad years. Good and bad years are equally likely in both countries: P(good year) = P(bad year) = 0.5.

a. Compute the expected return and range of returns for each country's stock market.
b. Suppose both countries experience identical shocks, so that they both have good years at the same time and bad years at the same time. Compute the expected return on an equal-weighted portfolio of the two country's stocks, and compute the range of returns.
c. In this case, does a risk-averse investor in Argentina prefer to hold only shares from his own country or the equal-weighted portfolio? Explain.

5. Instead, suppose the shocks affecting the two countries are independent: whether Argentina has a good or bad year is completely unrelated to whether Belarus has a good or bad year.

a. Now, there are four possible states of the world. List them, and determine the probability of each.
b. In each possible state, determine the return on an equal-weighted portfolio.
c. Compute the expected return on the equal-weighted portfolio and the range of possible returns.
d. In this case, does a risk-averse investor in Argentina prefer to hold only shares from his own country or the equal-weighted portfolio? Explain.
e. Is the range a useful measure of risk in this example (refer to 4b and 5c)? Why or why not?