Baylor University
Hankamer School of Business
Department of Finance, Insurance & Real Estate

Risk Management
Dr. Garven
Problem Set #6

Name: _____

Show your work and write as legibly as possible. Good luck!

Problem 1

The following table lists the state-contingent returns on Security A ($r_{A,s}$) and Security B ($r_{B,s}$):

State of Economy	p_s	$r_{A,s}$	$r_{B,s}$
Bust	50%	-0.2000	+0.2500
Boom	50%	+0.4000	-0.0500

A. What are the expected returns for Security A and Security B?

B. What are the standard deviations of the returns for Security A and Security B?

C. Find the expected return and standard deviation for the least risky combination of Security A and Security B. What is the composition of this portfolio (i.e., find the security weights w_A and w_B)?

D. Suppose your initial wealth is $1,000 and that you can borrow or lend up to $1,000 at the riskless rate of interest of 3% during the course of the next year. Given this information, describe the most profitable *riskless* trading strategy which can be implemented, and calculate the profit from implementing this strategy.

Problem 2

Suppose you have two stocks in your portfolio, *Maxima* and *Minima*. The expected return of *Maxima* is 12% and the expected return of *Minima* is 6%. The standard deviation of *Maxima* is 20% and the standard deviation of *Minima* is 12%. The correlation between the two securities is zero. Suppose the riskless asset has an expected return of 3%.

A. What is the mean and standard deviation of the Minimum Variance Portfolio combination of *Maxima* and *Minima*?

B. Which has the highest Sharpe ratio, *Maxima*, *Minima* or the Minimum Variance Portfolio combination of *Maxima* and *Minima*?

C. Suppose the correlation between *Maxima* and *Minima* is -1. If this were the case, there would be an arbitrage opportunity, since a combination of *Maxima* and *Minima* exists that is riskless and yields a higher expected return than the riskless asset. Describe the characteristics of a portfolio strategy that would enable you to generate positive profits without having to bear any risk or put up any of your own money. Assume that there are no restrictions on short sales or margin requirements.

D. Now suppose the expected return to the market portfolio is 8%, and the standard deviation of the market portfolio is 15%. Assuming that the CAPM holds, what are the betas for *Maxima* and *Minima*?