Project 2

Due on February 17 by 5 pm

FINA 4310 - Spring 2012
Survey of Investments

1 Diversification Classics *(100 points)*

The file Project 2.xls in the Projects folder contains the monthly return to Amazon (AMZN) and Wells Fargo (WFC) in 2005-2009, as well as the market excess return (MKT-RF) and the risk-free rate (RF) in the same time period. Use these data to answer the questions below:

i. Compute the average, the standard deviation, and the correlation for Amazon and Wells Fargo. *(10 points)*

ii. If you can only invest in the risk-free asset and either Amazon or Wells Fargo, which one do you pick? *(5 points)*

iii. If you can only invest in the risk-free asset and either Amazon or Wells Fargo and your target standard deviation is 25% per annum, what will be your best possible expected monthly return? What weight does the risk-free asset take in your portfolio? *(10 points)*

iv. Compute the average return, standard deviation, and the Sharpe ratio of the portfolio that invests 70% in Amazon and 30% in Wells Fargo *(5 points)*

v. Does the existence of Amazon and WFC violate the CAPM? (Hint: You will need to use the data on the market excess returns). *(5 points)*

vi. Redo (iv) assuming that the correlation between Amazon and Wells Fargo is 0.7. What does it tell you about the benefits of diversification? *(5 points)*

vii. What combination of Amazon and Wells Fargo creates the minimum variance portfolio (MVP)? What are the average return, standard deviation and the Sharpe ratio of this portfolio? (Hint: use the Solver add-in) *(10 points)*

viii. What combination of Amazon and Wells Fargo creates the mean-variance efficient portfolio (MVE)? What are the average return, standard deviation and the Sharpe ratio of this portfolio? (Hint: use the Solver add-in) *(10 points)*

ix. *Bonus question*: Estimate the market model for Amazon and the market model for Wells Fargo. Do either Amazon or Wells Fargo violate the CAPM by a statistically significant amount *(10 points)*

x. Assume that Amazon and Wells Fargo are the only two stocks in the economy. Under the CAPM, what are the average return and standard deviation of the market portfolio? What are the average return and standard deviation of the zero-beta portfolio? (Hint: Use your solution to (viii) to answer this question) *(10 points)*

xi. *Bonus question*: Redo (iii) assuming that now you can invest in Amazon, Wells Fargo, and the risk-free asset simultaneously. What are the weights of Amazon, Wells Fargo, and the risk-free asset in the portfolio that delivers the best possible return for the target standard deviation of 25% per annum? *(10 points)*

xii. Assume that Amazon and Wells Fargo are the only two stocks in the economy and there is no risk-free asset. For each of the following three points - (1.4%, 9.23%), (2.03%, 9.3%), (3.1%, 16%) - answer two questions: (a) Will you want to choose it? (b) Can you have it? The first number of the pair is always expected return. (Hint 1: use Goal Seek. Hint 2: do not forget comparing the point with MVP). *(20 points)*

xiii. How would your answer to (xii) change if the risk-free asset is available? *(10 points)*

The project can be completed in teams of up to 4 people. The team has to produce the joint written output. The assignment is graded out of 100 points. The maximum number of points you can get is 120 (if you solve the two question). I expect only a few teams to solve them, so do not be disappointed if you are not among these teams. Late submission is punished - handing in the project on Monday, February 20, loses you 20 points, handing it in on Tuesday, February 21, loses you another 10 points. I will distribute the solution on Wednesday, February 22. Any team that does not turn in the project before Wednesday, February 22, gets 0 points for it.