

Introduction to Finance - II

Quiz 2 *January 29, 2019*

Read the questions carefully. Don't make them harder than they are! Answer succinctly and precisely. Show all of your work.

1. Suppose that you have a spreadsheet with a column of 10 years worth of monthly returns on AMAT and XLNX in Excel. You have 120 monthly returns on AMAT in Rows 3 through 122 in column C in your spreadsheet. You have computed the mean of these 120, and this mean is .0085, in Cell C125 in the spreadsheet. Column D contains the deviation of the return that month from the mean. For example, Cell D10 contains  $= C10 - \$C\$125$  (the return in row 10 minus the mean return). You have also computed the variance by setting up Column E, which contains the squared deviations in Column D. For example, Cell E10 contains  $= D10^2$ . The average of these 120 squared deviations (the variance) is 0.017. The analogous information and computations for XLNX are in columns G, H, and I, and the mean return on XLNX (in Cell G125) is 0.011, and XLNX's variance (in Cell I125) is 0.022.

(a) **(20 points)** How can you use this spreadsheet to compute the covariance between AMAT and XLNX? Describe any new column(s) you use, and then what you do with that (those) column(s).

(b) **(10 points)** Suppose that you compute the covariance between AMAT and XLNX to be 0.006769. What is the correlation between AMAT and XLNX?

(c) **(10 points)** What is the expected monthly return on a portfolio that has 60% invested in AMAT and 40% invested in XLNX?

(d) **(20 points)** What is the monthly return standard deviation of a portfolio that has 60% invested in AMAT and 40% invested in XLNX?

(e) **(10 points)** Discuss the relationship between the portfolio standard deviation and the simple weighted average (using the portfolio weights) of the standard deviation of the two stocks. (State whether the former is larger, the same, or smaller than the latter, and *explain why.*)

2. Consider two stocks ABC and XYZ. Both have a mean monthly return of 0.0075 and a monthly return standard deviation of 0.144. Consider a portfolio that has 50% invested in both stocks.

(a) **(10 points)** What are the portfolio mean monthly return and standard deviation of monthly returns if the correlation between ABC and XYZ is 1?

(b) **(10 points)** What are the portfolio mean monthly return and standard deviation of monthly returns if the correlation between ABC and XYZ is 0?

(c) **(10 points)** What are the portfolio mean monthly return and standard deviation of monthly returns if the correlation between ABC and XYZ is -1?