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Late assignments will not be accepted so please plan accordingly. You need to show your working notes for credit. You must submit your work using excel files (with .xls or .xlsx for credit). You must upload your files on Blackboard under the Assignment Dropbox for credit.

This assignment will require you to analyze time series of monthly returns. Start by retrieving MONTHLY data for the period of 1 August, 2013 – 1 August, 2016 from Yahoo website for

- S&P 500 Index (ticker: ^GSPC)
- Exxon Mobil Corporation (ticker: XOM)
- Facebook, Inc. (ticker: FB)

Instructions for downloading the data from Yahoo!:

To obtain the monthly data for each company, on Yahoo! Finance website, enter the ticker symbol under Quote Lookup. Then, click on “Historical Data”. Enter “Time Period” as given above. For “Frequency”, make sure Monthly is selected and then click on “Apply”. Click on “Download Data”.

Instructions for sorting the data by DATE:

By default, the data is in descending order (Newest to Oldest). You need to re-sort the data so that the oldest date is at the top of your spreadsheet (i.e. highlight DATE columns and click on DATA and then SORT, make sure you “Expand the selection” is selected, then click on SORT and sort by Date and order by ‘Oldest to Newest’).

First Calculate Returns:

Keep only Date and Adj Close columns for each company. Put all three sets of data in one excel file to do further analysis.

Use the ‘Adj Close’ column to obtain returns for each period. Remember that the Adjusted Close column has already adjusted the prices for dividends and stock splits so you do not have to adjust for it again. Just use the adjusted close column to obtain the returns.

$$R_t = \frac{P_t}{P_{t-1}} - 1$$

Solve for the following:

- A. Calculate the average return, variance and standard deviation of returns of each series. Comment on the statistics.
- B. Calculate the covariance and the correlation coefficient between each of the return series (there should be a total of three correlations and three covariances). Comment on the statistics.

- C. If you were to form a portfolio that had 50% of the S&P 500 Index and 50% of Exxon Mobil, what would be the average returns and the standard deviation of that portfolio? (Ignore the fact that both Exxon may already be included in the S&P 500)
- D. If you were to add Facebook, Inc to your portfolio so that you now had 33% S&P 500, 33% Exxon Mobile, and 34% Facebook, what would be the new average returns and standard deviation? (Ignore the fact that both Exxon and Facebook may already be included in the S&P 500) Is Facebook a good addition to your portfolio? Why do you think so?
- E. Determine Exxon's beta and Facebook's beta for the Aug1 2013 – Aug 1, 2016 period. Comment on the statistics.



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