Problem Set 2

You are required to turn in an **Excel file**, i.e., all work must be completed in Excel. Please submit through Brightspace. You are allowed to work in groups of 2-4 students and turn in one assignment for the group. You can work alone, if desired. Please submit your own work, do not copy from classmates, the internet, or any other sources. Plagiarism will result with a grade of zero for this problem set.

Note: 0(x)y means to vary some number from 0 to y at intervals of x.

1. Use information on US treasury bills, notes, and bonds to graph the yield curve on 9/1/2023.

2. You are considering two bonds, Air Canada and Scotiabank. Air Canada's bonds have a coupon rate of 9% and a YTM of 6.5%. Scotiabank's bonds have a coupon rate of 6.5% and a YTM of 9%. Both bonds pay coupons semi-annually and have 14 years left to maturity. Assume a face value of 1,000.

   (a) What is each bond trading at today?

   (b) Assuming no changes in interest rates. What do you expect the bond prices to be one year from now? Two years? Five years? Ten years? Illustrate your answers by graphing bond prices versus time to maturity for each bond. (Use 0(1)14)

   (c) Explain the observed relationship.

3. Ducktales and Chip and Dale R.R. both have bonds with a 7% semi-annual coupon priced at par. Ducktales bonds have 3 years to maturity and Chip and Dale R.R. have 19 years to maturity. Assume a face value of 1,000.

   (a) What is the percentage change in price if interest rates rise by 2%? Fall by 2%?

   (b) Illustrate the relationship between bond prices for these two bonds and YTM. (Use YTM 0(1)15)

   (c) Explain the observed relationship.

4. Value line produces one-page reports on the Dow 30. You can find these reports under "Stock Report" on the following website: https://research.valueline.com/research#list=dow30&sec=list. Pick two companies from this list and complete the following tasks in Excel:

   (a) Assuming a zero growth rate, use the most recent dividend (annual) to calculate the stock price. Use a 10% required return. Graph the relationship between stock price and required return for each company. Describe the observed relationship.

   (b) Use the past 10-year growth rate and most recent dividend to calculate the stock price at a required return of 5%, 10%, 15%, and 20%, and 25%. For each required return graph (on the same graph) the relationship between stock price and growth rate. Vary the growth rate from 0 to 20%. Describe the observed relationship.

   (c) Assume the dividend will grow at the historical 5-year growth rate for the next 3 years and then grow at the 10-year growth rate thereafter. Calculate the stock price at a required return of 5%, 10%, 15%, and 20%. Create a sensitivity analysis table that

calculates the stock price at different 5-year and 10-year growth rates. i.e., what is the price if both rates are 1%, if the 5-year is 1% and the 10-year is 2%, etc. Vary each growth rate from 1% to 15%, and use a 20% required return. Describe the observed relationship.

(d) Use multiples to estimate the stock price. The benchmark should be the average firm P/E ratio from the last 10 years and use the current EPS. Create a graph of how the stock price would vary depending on the benchmark P/E ratio used. Describe the observed relationship.

(e) Provide a brief discussion of how accurate you were relative to the current stock price and the issues with these stock valuation methods.

5. Complete a relative valuation for a US public company. Using any multiple of your choosing, calculate the value of a company based on comparables. Please discuss your thought process in selecting the comparable company.