Project 1: Calculation Instructions
Due: 06/04/2023

Your goal in this project is to value a stock using a Discounted Cashflow Analysis (DCF). This is a commonly used tool in the financial services industry and can be quite advanced.[1] Try to "hardcode" as little as possible. When you use formulas, it is much easier to make changes in one place such that all other values change automatically. 15 points are allocated to formatting / formulas.

Step 0: Obtaining Information and understanding the firm (40 points)

Go to https://www.sec.gov/edgar/searchedgar/companysearch.html and find Walmart (WMT).

- What are some of the most common filings?
    - List three, and write a sentence or two describing when they are filed / what information they contain
- We will focus on the 10-K: The annual statement. This filing contains the important financial statements of a firm.
    - In accounting, you covered several types of financial statements. What are the "Big 3" financial statements?
- Briefly explain what industry Walmart is in and show where in the 10-K you got this information from
- Compute the following ratios for 2023 and explain what they mean (is larger better?). Do not hardcode!
    - Current ratio
    - Quick Ratio
    - Cash ratio
    - Times Interest Earned
    - Cash coverage Ratio
    - Total asset turnover
    - Profit margin
    - ROA
    - ROE
    - Price-Earnings Ratio
    - Price-Sales Ratio

Step 1: Estimating Inputs

Use the posted Excel Sheet for these calculations. See "Obtaining Information" for a description.
Fill in the following numbers (25 points):

- Year-to-year changes of Revenues and Expenses
- Depreciation & Amortization as a % of revenue in 2021 to 2023
- Interest as a % of revenue in 2021 to 2023
- CAPEX as a % in revenue in 2021 to 2023

[1] Do not worry about things like the mid-year convention, projecting individual costs, reconciling the Balance Sheet and Cash Flow Statement with the Income Statement , etc. This exercise is just to give you a basic idea of a valuation.

- Net Working Capital in 2022 and 2023
- Change in Net Working Capital (NWC) from 2022 to 2023
- In the Net Income prediction, keep this change in NWC constant. I.e. if you get a change of -3,000, use that -3,000 in every single year going forward.
    - Notice that since NWC needs to be subtracted, you may end up having a "double negative", therefore effectively adding NWC.
- Cost of debt

- Growth prospects of Walmart + Explanation (20 points) – this should include a discussion of the numbers you have calculated, plus some discussion of the industry and other factors (E-commerce,…)

Step 2: Predict Net Income (10 points)

This involves simply plugging in what revenue and costs etc. will be over the next few years. No PV/FV calculations needed. No growing annuities or anything else.
"Costs" needs to be split up into several rows: One row for expenses (**COGS + SG&A**), one row for interest. Note that depreciation is included in SG&A!
Use a revenue growth rate of 2% and a cost growth rate of 1.65%. Keep tax expense constant at 21% of EBT.

	2024	2025	2026	2027	2028
Revenue					
-COGS, SG&A					
-Interest					
=Earnings before Taxes					
-Taxes					
=Net Income					

Step 3: Calculate Free Cash Flow (FCF) (6 points)

Again, no PV/FV calculations, just adding / subtracting. Add on to the table from step 1, do not re-do revenue to net income. **If the change in NWC is negative, you need to subtract that negative, which means you effectively add it on.**

	2024	2025	2026	2027	2028
Revenue					
Costs					
Interest					
EBT					
Taxes					
Net Income					
+ Depreciation & Amortization					
- CapEx					
- Changes in NWC					
= FCF					**Use this number in step 6**

Step 4: Calculate the discount rate (wacc) (7 points)

Remember the formula: $w_D * c_D * (1-t) + w_E * c_E$, where w_D = Debt/(Debt+Equity) and w_E = Equity/(Debt+Equity), t and c_D are given and c_E has to be calculated using the CAPM. Everything for the CAPM calculation is given. So, calculate the CAPM first to get the cost of equity and then plug it into the wacc calculation.[2]

Step 5: Calculate Terminal Value (4 points)

Terminal Value is essentially the value of a firm if its free cash flow grows at a certain (constant) rate forever. In other words, it is calculated as a growing perpetuity with C = Net FCF in 2028 (Bottom right cell in table of step 2) * (1+g). So: TV = C*(1+g)/(r-g). Note that this growth rate is called "Terminal Growth Rate"

Step 6: Discount the DCF and discount the Terminal Value you calculated. (5 points)

	2024	2025	2026	2027	2028	Terminal Value
Revenue						
Costs						
EBT						
Taxes						
Net Income						
+ Depreciation						
- CapEx						
- Changes in NWC						
= FCF						**From step 5**
DCF	=FCF/(1+r)	=FCF/(1+r)^2	=FCF/(1+r)^3	FCF/(1+r)^4	FCF/(1+r)^5	Terminal Value/(1+r)^5

Step 7: Calculate the Intrinsic Value (6 points)

Start with the sum of your discounted cash flows (last row in table above). Make sure to include the Discounted Terminal Value!

Enterprise Value	=Sum(DCF)
+Cash	
-Debt	
=Equity Value	

Step 8: Interpretation (21 points)

a. Explain what the change in Net Working Capital is. If Net Working Capital increased, do you now have more or less cash? GOOGLE THIS to double-check your answer.
b. Calculate the Equity Value/Share: Equity value divided by number of common shares (from stockholders equity statement: highlighted)
c. Would you currently buy this stock?
d. Assuming the stock is currently priced correctly, what is the implied terminal growth rate g? Hint: Copy your worksheet and then use Excel Solver. Alternatively: Try different values for g until you get the current market price. Is this reasonable?

[2] For this assignment, we will not un-lever and re-lever the wacc.

Step 9: Sensitivity / Scenario analysis (20 points)

a. What happens to the value per share if the wacc changes? Use data tables (under what-if analysis) and conditional formatting to make it look nice.
b. Imagine the Federal Reserve Bank raises interest rates, thereby increasing cost of debt and risk-free rate. Quantitatively show and qualitatively explain how this would affect your valuation. Assume everything else stays constant.

Step 10: Alternative methods (21 points)

a. If instead of calculating the Terminal Value as a growing perpetuity you would have used the EV/EBIT multiple, what would you have used as a multiple?
    a. What is the Terminal Value if you use this multiple instead of the perpetuity?
b. Skim https://corporatefinanceinstitute.com/resources/knowledge/valuation/valuation-methods/ . If you wanted to use the "Comparable Analysis" method, what would you do? Name two potential companies you could use as "comparables"
c. What does "Garbage In = Garbage Out" mean? What are your thoughts on the assumptions made in this assignment?

Thank you for your hard work in this class! I hope it was useful and interesting for you.