FIN325 - Homework 3
Due : Friday October 20 by midnight, on canvas, pdf only

Problem 1 (25pts)

Two investors are going to co-invest in a three-year project whose cost in year 0 is $100M. Investor 1 is a passive investor that finances 90% of the cost of the project. Investor 2 (the operator) finances 10% of the initial cost and will run the project. In the benchmark scenario, the project will generate $50M in year 1, $50M in year 2, and $30M in year 3.

The contract between the two investors features an incentive clause for the operator. Specifically, cash-flows will be distributed according to the initial stake (90% to the passive investor, 10% to the operator) until the passive investor gets an IRR of 10%. Once enough cash flows have been generated to deliver this return, excess cash flows will be split 50-50 (50% to the passive investor, 50% to the operator.)

If the benchmark scenario materializes, what IRR is the operator going to get from this project?

Problem 2 (25pts)

A lender has agreed to issue a fully amortizing bond with face value $100M, twenty yearly payments, and an interest rate of 10%. Payments will grow by $g\%$ a year for 10 years. After year 10, payments are flat. (So year 11 payment is the same as year 10, as are all subsequent payments)

1. If $g = 1\%$, what is the bond's outstanding principal at the start of year 5?

2. Above what growth rate does the bond begin to feature negative amortization, holding the interest rate the same?

Problem 3 (25 pts)

Recent monthly data on the returns on company X's stock (r_X), the market portfolio (r_M) and a risk-free asset (r_F) are:

r_X	r_M	r_F
1	2	1
2	1	0
3	4	1
5	4	0
4	5	1

1. Based on these data and a CAPM regression specified <u>in excess returns</u> (**NOT a regression of just r_X on just r_M**), estimate and report company X's beta.

2. Company's X debt-to-equity ratio is 1.5 while its tax rate on EBIT is $\frac{1}{3}$. Given your estimate in step 1, what is company X's unlevered beta?

Problem 4 (25 pts)

For a corporation of your choice (state your Ticker), estimate the company's CAPM β using 5 years of monthly total return data downloaded from FactSet, and the Fama-French database for the risk-free and market rates. Compare that beta with the 5-year beta reported by FactSet.