

RE740 - Homework 1
Due : September 23rd

Problem 1 (30 pts)

Become Bloomberg certified. Each group member must turn in a certificate of completion. At least one group member must get certified for the equity module, at least one group member must get certified for the fixed income module.

Problem 2 (25 pts)

Pick a publicly traded REIT which your group will study for the remainder of the semester. All data below must be downloaded using Bloomberg.

1. Describe the company's portfolio of assets in one page. Break down revenues by segment and geographical area.
2. Plot the asset's monthly close price (adjusted for dividends and splits) against the S&P500 index since your REIT's IPO. In order to plot both series on the same chart and be able to compare them, normalize the price of each asset to be 1 in January 2000. In other words, divide all prices in each series by the price in January 2000.
3. Compute your REIT's beta where the S&P500 is assumed to be the market portfolio. Does your calculation come close to publicly available estimates of this statistic?
4. Do the same calculation using the MSCI US REIT index instead of the S&P500. How does this re-estimated beta compare to your previous estimate?

Problem 3 (25 pts)

A property buyer needs to finance a \$100,000 purchase with a mortgage.

1. A bank offers a 10-year fixed-rate, fully amortizing contract with monthly payments at a yearly rate of 7% (a monthly contract rate of $r = \frac{7}{12}$ %). Use Excel to calculate payments, interest payments, payments toward principal, and the end-of-period balance over the life of the loan.

2. Assume that the buyer prefers a contract with a \$40,000 balloon payment at the end of 10 years. Assuming that the yearly yield is 7% still, compute the new payment and principal schedule.
3. Assume now that the buyer prefers a contract such that payments increase by exactly $g\%$ every month, where $g > 0$. Assume once again a fixed rate r and **full amortization**. Let $g = \frac{15}{12}\%$ and $r = \frac{7}{12}\%$. Use excel to calculate payments, interest payments, payments toward principal, and the end-of-period balance over the life of the loan.
4. Under the same set-up as in the previous question, above what g does the loan begin to feature negative amortization?
5. Holding once again r the same, use Excel's solver function to find g so that over the course of the loan the maximum level of outstanding principal is \$102,000.

Problem 4 (20 pts) - Challenge: I want to see what you can do, no questions allowed on this one, just get it done.

Consider a project that requires an initial equity injection of \$1M. The managing owner will provide 10% of this investment, the rest will provided by a passive investor. Under the baseline scenario, net equity flows are 10% of the initial injection in year 1, grow by 10% every year after that. In year five, the property is sold and the reversion flow to equity is 10 times year 6 projected cash flow.

The managing owner gets 10% of net equity flows until a 10% hurdle IRR is reached by the passive investor (Tier 1), 20% of the remaining cash flows until a 15% IRR is reached by the passive investor (Tier 2) and 50% of equity flows thereafter (Tier 3.)

What are cash flows to both equity holders under the baseline revenue scenario?
 What is the IRR of both equity holders?