THE OHIO STATE UNIVERSITY
FISHER COLLEGE OF BUSINESS

The Unlikely Outcome Case

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You are considering the purchase of an industrial property (warehouse and offices).

Sale price: The seller is asking $1.8m, which is computed based on the expected Net Operating Income (NOI) and a cap rate of 11%.

Tenant: Chipset Limited currently occupies and leases the entire property. The company produces electronic circuits.

Current lease terms: The Effective Gross Rent (EGR) is $55,000 per quarter. Operating Expenses are expected to be 10% of EGR. You project that the likelihood the company will go out of business to be 0.8% each quarter and that the timeframe to sell the building, if they do, to be two years. The lease is triple-net (http://www.investopedia.com/terms/n/netnetnet.asp) for 25 years, which includes upwards-only rent reviews every five years. The rent will be adjusted to the Consumer Price Index (CPI). Note: (NOI=EGR – Op. Ex.).

Consumer Price Index (CPI): The CPI is 100 today and it is expected to fluctuate quarterly based on historical data. Please see the historical CPI fluctuations attached to determine the expected quarterly fluctuations.

Future sale: You plan on holding the property for 25 years, unless your tenant defaults. If the tenant defaults, the property is expected to sell at a 25% discount to the current asking price, adjusted to the CPI.

Loan: The acquisition will be financed with a 90% loan-to-purchase price loan. Note: the "purchase price" includes the cost of the asset plus 5% for transaction costs. The loan is an interest only loan with an interest rate of 6% paid quarterly. The principal of the loan will be paid after 25 years, or the sale of the property, whichever comes first.

Discount rate: You estimate the proper discount rate to be 9% for the property cash flows and 25% for the equity cash flows.

Taxes: For the purposes of this exercise it is assumed there are no taxes.

Your task is to evaluate the investment opportunity. Follow these steps:

1. Build a base Pro forma valuation model.
   a. Obtain Unlevered Property Cash flows: Build a model that forecasts the expected future cash flows from the asset (rent + sale), conditional on the sources of uncertainty: (i) default of the tenant, and (ii) Consumer Price Index.

   b. Obtain Levered Property Cash flows: Add to the model the interest and principal payments to the bank. Calculate the residual cash flows to and from the equity investor.

   c. Calculate the Unlevered and Levered Values: Value the cash flows from the property before and after levering with debt.

2. Monte Carlo Simulation: Run the model with 1,000 simulations and record the results.

3. Present a histogram of the distribution of the unlevered property values obtained from the simulations. What is the average value? What is the median value? Is the price that the seller asks for too high, reasonable, or too low?

4. Present a histogram of the distribution of levered property values obtained from the simulations. What is the average value? What is the median value?

5. What is the likelihood that the value of the property at the time of the future sale will be lower than the amount owed to the bank?

6. What is the likelihood that the future sale price will be lower than the present purchase price?

7. A day after you purchased the property, your tenant approaches you and requests an alteration to the contract. They propose increasing the rent to $60,000 a quarter, however, to eliminate the upwards-only rent revisions clause. Calculate whether this is a worthwhile modification of the contract.

8. In the current setting, the likelihood of default of the tenant is independent from the change in the CPI. Suppose now that the tenant would be more likely to default following a decline in the CPI. Qualitatively, how will this correlation affect your calculations? Will that fact make the property more or less attractive to a potential investment? (No need to make calculations)

9. Analyze the CPI fluctuation and default risk uncertainty on the property valuation. Which uncertainty has a greater influence on the valuation? Qualitatively, what could be done to decrease the uncertainty of either assumption or to hedge against the corresponding risk associated with the uncertainty?

Helpful Excel Tips

1. Uniform Distribution
    - =(C26-C27)*RAND()-C27
    - This generated a random draw from a uniform distribution between the value in cell C27 and cell C26.

2. Normal Distribution
    - =NORMINV(RAND(), “mean” , “standard deviation”)
    - This generates a random draws from a normal distribution based on the mean and standard deviation parameters given in the formula.

3. To generate random draws from a large sample
    - =INDIRECT("'cpi2'!G"&RANDBETWEEN(4,410))
    - This chooses random draws from the values between G4 and G410 on sheet cpi2.

4. Monte Carlo Simulation
    - Highlight region where first row includes simulation #1 and the NPV reference cell.
    - Data => What if analysis => Data Table
    - The “Column Input Cell” is the column header titled NPV that is just above the NPV reference cell.

5. Histogram Creation
    - Bin Values
        - Select 20 to 40 identically spaced breakpoints between the min and max of the Monte Carlo simulations.
    - Use the “frequency” Excel function to allocation the simulation results into the different breakpoint bins.
    - Create a histogram either by inserting chart and selecting the appropriate data, or from the Data tab, click Data Analysis from within the Analysis group. From the Data Analysis dialog box, click Histogram, and OK.