

FIN460: Real Estate Finance and Investment

Exercise 1: Buy or Rent

Objectives

In this exercise, we will investigate the question of whether it is better to buy or rent, and whether our decision is robust to changes in our assumptions. We will use Excel to build a Discounted Cash Flows (DCF) model for renting and one for owning. In the process, we will cover how to:

- Calculate NPV and IRR
- Compare options
- Use data tables in Excel to perform sensitivity analysis for single and double variables
- Use scenario manager in Excel
- Use conditional formatting in Excel

Deliverable

You will write-up and submit a short, executive summary with sections answering the following questions:

- **Conclusion with Recommendations**
 - Answer the question, "Is it better to buy or rent?"
 - Provide a one line summary of the results from sensitivity analysis
 - Based on our results from scenario analysis, provide the conditions for when it is better to buy, and when it is better to rent
 - Provide any recommendations of when to avoid buying or renting
- **Methodology**
 - What three general steps did we include in our methodology?
- **Assumptions**
 - Copy and paste the base case assumption tables for renting and owning
 - Are there any additional assumptions that should be stated? (Bullets are fine)
- **Sensitivity and Scenario Analysis**
 - Which variables was the decision insensitive to, slightly sensitive, and highly sensitive?
 - Provide and two variable data table with the most highly influential variables
 - Scenario manager, provide the table of the scenario manager summary with a couple summary sentences restating our results.
- **Caveats or Concerns:**
 - Do you have concerns with the internal or external validity of the model?

Due Date: Upload your word doc (or pdf) and Excel file to the Blackboard link by Thu, June 11th 11:59pm.

Grading: This will be graded on a complete/incomplete scale

Tips for Excel

- No decimals
- Input cells at top with a colored background, output with a separate color
- Anchors with F4, anytime you link to the assumptions
- Conditional highlighting (you can use format painter on conditional formatting with and without anchors)
- NPV function does not include the time zero cash flow
- Stay aware of year <-> month conversions

Instructions

1. Renting

- (a) What cash flows are associated with renting?
- (b) What discount rate should we use for renting?
- (c) What time horizon should we use?
- (d) What is the NPV of renting? (What do we expect it to be?)

2. Owning

- (a) What cash flows are associated with owning?
 - It is sometimes easier to brainstorm when drafting the incremental FCF
 - Including taxes, PITI, transaction costs
 - Sale of House (Sale price - Sales commissions - loan payoff = Net Proceeds from sale of House)
- (b) What discount rate should we use for owning? ([Case-Shiller Index at FRED](#))
- (c) Create sections for
 - Loan calculations
 - Loan time line
 - Property time line
 - Incremental FCF
- (d) What is the NPV of owning?
- (e) Add conditional highlighting to the NPV Cell.

3. Preliminary Results: Based on our current model:
 - Is it better to own or rent?
 - Are either good investments?
4. Use sensitivity analysis to identify variables to which our decision is sensitive to
 - (a) Choose a single variable, and create a data table in Excel. Select NPV as our result variable, and make a reasonable range for the input parameter.
 - Add conditional highlighting to the NPV output.
 - Is our result sensitive to changes in this variable?
 - Does our result change throughout a reasonable range of inputs?
 - (b) Highlight all the variables which we can change.
 - (c) Create a data table for each of the other adjustable or random variables.
 - (d) Which two variables does our result seem most sensitive to?
 - (e) Create a two variable sensitivity table with those two variables. Is our decision robust to changes in those two variables?
5. Does changing the time horizon change our findings?
 - (a) On each spreadsheet, create an individual NPV for each year (will need to create a selling scenario for each year).
 - (b) Calculate the IRR for each holding period as well.
 - (c) Does our decision to buy or rent depend on our holding period
6. Use scenario manager to evaluate base, best and worst case scenarios to determine whether our base case conclusion is robust to changes in the input parameters
 - (a) Create a base case scenario in scenario manager by identifying the influential variables and inputting an expected value
 - (b) Similarly, create a best and worst case scenario considering outer ranges of the same parameters
 - (c) Create a scenario manager summary table (with the NPV of renting added to the table)