FIN460: Real Estate Finance and Investment
Quiz 4: Is Bigger Better?

Objectives

In 2006, the Wall Street Journal published an article investigating whether it was financially smarter to buy a $400,000 house, or invest more, buying a $1,000,000 home. They concluded that it made more financial sense to buy the smaller house, and to invest your annual savings in a mutual fund. (See the attached article.)

For Quiz 4, you will investigate this question using the financial tools we've practiced in class. The model will be developed under the assumption that the house will be owner occupied. This will affect how capital gains, and expenses, such as interest and depreciation, are taxed. Recall, that that the first $500,000 in capital gains are excluded from tax for married filing jointly.

Deliverables

For the quiz, you will create an Excel sheet with your model, and a Word document with answers to the to the highlighted questions in the instructions.

Submit both documents to the Blackboard link, before leaving the classroom. Turn in the Quiz 4 Instructions as well.

Due Date: Upload your completed Word doc to the Blackboard link on Mon, July 6^{th} either by 7:20pm or before leaving the classroom.

Grading: This will be graded out of 15 Points

Rules

- **You must download and use the Excel Template found on Blackboard under Quiz.** Failure to do so will result in a zero on the quiz.
- The quiz is open book, open notes. You can access any resource we used in class, however, you may not communicate with each other.
- You cannot copy and paste formulas from other spreadsheets.
- Hard key numbers in the orange cells only. For any other cells, only enter formulas, cell references, or 12 to adjust for periods.

Directions

1. Read the attached Wall Street Journal Article.
2. Download the Excel Template from the Quiz Link on Blackboard and save to your hard drive as "Quiz 4 [Your Last Name]".
3. In the Excel file, you will end up with 2 work sheets, one for the Small House Strategy, and one for the Large House Strategy. First, create the model for the Small house Strategy. It will be easier to create this model first, and then just copy the worksheet to create the Large House Strategy.
4. Rename the worksheet from"Template" to "Small House Strategy".
5. Starting with the Small House Strategy, enter the inputs in the Excel drawn from the article.
    - The down payment will be given as a monetary amount, not as a percent. The down payment will be the same for both strategies.
    - If an assumption in the article is inconsistent with an assumption we've been using in class, defer to the one in the article.
    - Property taxes and Insurance will not be included in the payment, but in the "Expense" line item, as specified in the article.
6. **Question 1:** Based off information in the article, what rate did you choose for your required rate of return? Why?
7. Create a model to calculate the NPV and IRR of the Small House Strategy.
    - Assume that the house will be sold when you are 65.
    - This is an owner occupied residence. You will need to consider appropriate tax payments and shelters for: interest expense, depreciation, and capital gains tax.
    - It might be helpful to segment this model into separate sections,including Loan Calculations, Loan Timeline, Property Timeline, Net Proceeds from Sale, and Incremental FCF.
8. **Question 2:** For the small house, what amount did you get for the Net Proceeds from Sale. How did you calculate this amount? (Copy and paste the line items from your spreadsheet.)
9. **Question 3:** What amount did you get for the Capital Gains Tax? How did you calculate this amount? (Copy and paste the line items from your spreadsheet.)
10. **Question 4:** What was the Incremental FCF for year 1? What items were summed to obtain this result? (Copy and paste the line items from your spreadsheet.)
11. **Question 5:** What is your resulting NPV and IRR?
12. Create a copy of the worksheet. Rename this new worksheet, "Large House Strategy."
13. Adjust the required inputs, and calculate the NPV and IRR for the large house.
14. **Question 6:** What is your resulting NPV and IRR for the Large House Strategy?
15. **Question 7:** Based on your results so far, do you agree with the article that the smaller house is the best financial choice for your primary residence? Explain.

As mentioned in the article, some people argue that they expect a higher property growth rate of 14%. Others argue that property growth is closer to inflation. Using sensitivity analysis, you will examine your previous results to see if they are robust to changes in your underlying assumptions.

16. Create a single variable sensitivity table on both work sheets, which illustrate the sensitivity of the IRR to changes in the property growth rate.
    - Investigate over the range of property growth from 0% to 10%, changing by 1%.
    - As mentioned, the variable of interest will be IRR.
17. **Question 8:** Create a sensitivity table similar to what is shown below, and copy and paste that table into your word doc. Based on this sensitivity analysis, does your answer to Question 7 change? Why?

Property Growth	Small House IRR	Large House IRR
0.00%		
1.00%		
2.00%		
3.00%		
4.00%		
5.00%		
6.00%		
7.00%		
8.00%		
9.00%		
10.00%		

18. **Question 9:** In summary, what is your recommendation, a small house or large house strategy? Why? As mentioned in the article, explain the advantages or disadvantages of scaling up to a large house as opposed to scaling up an investment in a mutual fund or index fund?
19. **Question 10:** Based on the results from your analysis, can you comment on whether large properties make poor income producing rental properties? What change to the model might you do to examine this question.

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Forget the Mansion: Why Buying Bigger Doesn't Guarantee a Rich Retirement

By

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This is one tab the house won't pick up.

It's among today's most popular retirement-savings strategies: Buy the big house, hope the real-estate boom continues and then trade down at retirement, thus freeing up home equity that will pay for years of early-bird specials.

Sound appealing? Trouble is, you will fork over a heap of dollars -- and you'll end up with a surprisingly small nest egg.

Living large: To understand why, imagine you are age 35, have a $400,000 home with a $300,000 mortgage and are looking to retire at age 65.

What's the best way to build yourself a nest egg? You might stick with your current home, pay down that mortgage over the next 30 years and stash your spare cash in stock and bond mutual funds. Call this the "small-house strategy" (though, in many parts of the country, a $400,000 home wouldn't be exactly small).

Alternatively, you could opt for the "big-house strategy" -- trading up to a $1 million home and aiming to pay down the resulting $900,000 mortgage between now and retirement. At age 65, you would then cash in a big chunk of your home equity by swapping back to the equivalent of a $400,000 home.

Which strategy would leave you richer? To make sure today's real-estate junkies don't quibble too much, we'll make the assumptions favorable to the big-house strategy.

MONEY PIT

Buying, selling and owning real estate isn't cheap.

- Baby-boomer homeowners spent an average of $2,200 on home improvements in 2003.
- On a $200,000 mortgage, closing costs will typically cost you around $3,000.
- In 2004, home sellers paid real-estate brokers an average of 5.1% in commissions.

Sources: Bankrate.com; Harvard's Joint Center for Housing Studies; REAL Trends

For starters, let's assume you could get a 30-year fixed-rate mortgage at 6.5%. The $900,000 mortgage would cost you some $5,700 a month, versus $1,900 for the $300,000 mortgage.

Meanwhile, we'll peg your home's price appreciation at 5% a year, versus 3% for inflation. That two-percentage-point annual real return is right in line with the historical average.

"People might look at this and say, 'Five percent on my house is ridiculous; I'm getting 14%,' " notes Charles Farrell, a financial consultant in Medina, Ohio, who helped me with this analysis. "But you aren't going to get 14% a year for 30 years."

Mr. Farrell calculates that, at age 65, your $1 million home would be worth $4.3 million [$1.8 million in today’s dollars] . At that point, you sell it and buy that $400,000 home.

Because smaller homes would also be appreciating at two percentage points a year above inflation, a $400,000 home by then would cost roughly $1.7 million [$700,000 in today's dollars]. That would leave you with $1.1 million for retirement living expenses.

That might seem like a decent gain -- but it comes at a steep price. With the big-house strategy, not only would you face hefty mortgage payments, but you also would have to pony up for property taxes, maintenance costs, homeowner's insurance and utilities.

Let's lowball these ongoing expenses and put them at 2% a year of your property's value. Add that to the mortgage, and you would be coughing up $88,000 in the first year you own the big house.

> **Staying small:** To be sure, with the small-house strategy, you would also have ongoing expenses and monthly mortgage payments. The sums involved, however, would be far smaller. Suppose you took the money you saved by sticking with the small house and sunk it into a mix of mutual funds.

Let's be extremely conservative and assume these mutual funds clock a mere 5.2% [2.2 percentage points a year above inflation]. That is what you can earn today by buying 10-year inflation-indexed Treasury notes, possibly the safest long-term investment you can make. After 30 years, Mr. Farrell calculates that your portfolio would be worth $2 million in today's dollars, almost twice what you would pocket with the big-house strategy.

True, we are ignoring the value of the mortgage-tax deduction with the big-house strategy, and we haven't figured in the taxes on the investment portfolio with the small-house strategy. On the other hand, if you followed the small-house strategy, you could get a tax deduction for contributing to an individual retirement account or 401(k) plan. Your 401(k) investments might also garner a matching contribution from your employer.

The bottom line: Unless you lose nearly half your investment portfolio to taxes, the small-house strategy wins hands down. And, of course, the margin of victory would be even larger if we use more realistic assumptions.

For instance, suppose the investment portfolio earned four percentage points a year above inflation, while maintenance, utilities and other costs ran at 3% of your home's value. Result: The small-house strategy would give you not double the spending money, but triple.

"The killer is the expenses on the big house," Mr. Farrell says. "It's costing you a lot to carry this $1 million investment. That money is just going out the window, while the small-house guy is investing the money."

There is, however, an upside to buying the bigger home. For the next 30 years, you would live in a grander place. But that just highlights what this is all about. Buying a bigger house isn't an investment. Rather, it is a lifestyle choice -- and it comes with a brutally large price tag.

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