FIN460: Real Estate Finance and Investment
Exercise 3: Should you buy points on a mortgage loan?

Objectives

In this exercise, you will investigate the effect of points on the effective rate of a mortgage, and address the question, "Should I buy points on a mortgage loan?" In the process, you will

- Develop experience using two capital budgeting tools: internal rate of return and payback period

- Create a point-effective rate calculator capable of calculating the effective APR after points and loan fees are considered

- Utilize the solver add-in for Excel

Deliverable

Create a Word doc with answers to the 8 questions highlighted in the directions.

Due Date: Upload your completed Word doc to the Blackboard link by Thu, June 25th 11:59pm.

Grading: This will be graded on a 0/1.5/2.5 scale, where:

- 0: Less than 50% correct

- 1.5: Between 50 and 75% correct

- 2.5: Greater than 75% correct

Directions

1. **Question 1:** In your own words, in one sentence, explain a mortgage point.

2. In Excel, create the following template.

Loan Information

Loan Amount		
Down Payment		
FICO Score		
Loan Type		
Term		
Loan Purpose		*Mortgage or Refinance*

Loan 1) Without Points

Interest Rate (not APR)		*Source: www.bankrate.com*
Fees		*Source: www.bankrate.com*
Net Loan		*The net loan is the total loan amount minus fees and points*
Payment		*The lender bases the payment on the total loan amount*
Effective Rate		*The effective rate is based on the net loan amount*

Loan 2) With Points

Interest Rate (not APR)		*Source: www.bankrate.com*
Fees		*Source: www.bankrate.com*
Points		*Source: www.bankrate.com*
Net Loan		*The net loan is the total loan amount minus fees and points*
Payment		*The lender bases the payment on the total loan amount*
Implied Point Deduction		*The difference in rates divided by the number of points*
Effective Rate		*The effective rate is based on the net loan amount*

3. Go to www.bankrate.com and obtain quotes for two comparable loans, one with points and one without. Obtain the points, rate (not APR), and fees for both loans. For this exercise, choose loans with no origination fees. (Stay on bankrate.com to compare your effective rate with APR provided by bankrate.com - which you will need in a few steps)

Search Summary

Your Search	Results Range	Bankrate.com National Average*	Bankrate.com Site Average*
30 Year Fixed Refi, 1.01 – 2.0 Points, $180,000 Add other products ▸	3.85% APR - 4.27% APR	4.18% RATE	4.22% RATE

Sort by:	APR: 3.85%	Points: 1.10	Est Payment: $872	Credit score:	Percent down:
Default ▼				740+ ▼	20% down ▼

30 year fixed refi, 1.01 – 2.0 Points

Lender	APR	Rate	Est Mo Payment	Have Questions?	Learn more
AimLoan.com A Direct Lender ★★★★★ (12) Lender info NMLS # 2890 State Lic # BK-0906323	3.857% Thu Jun 25	3.625% at 1.100 pts 30 day rate lock	Payment: $821 Fees in APR: $3,065 More details	(877) 365-1034 (Toll-free, no obligation)	Next

4. Complete the formulas in the Excel spreadsheet to calculate the effective Rate for both loans. Note the following:

   - The lender calculates the payment based on the total loan amount.

   - Your effective rate is calculated based on the amount of money you receive at closing, which is the total loan minus fees and points paid.

   - Each point costs 1% of the total loan amount.

   - When entering TVM functions, keep the PV, PMT, and FV signs consistent. Enter the PV as a positive, PMT as a negative, and FV as a negative.

5. For the loan with points, compare the effective rate you calculated, with the APR provided by www.bankrate.com. **Question 2:** How do they compare? Take a screenshot of your excel sheet and the webpage, which show both these rates, and paste into your deliverable. In your own words, in two sentences or less, explain the difference between the stated rate and the APR, or effective rate.

6. At this point, you should have two effective rates calculated based on quotes from www.bankrate.com. One for a loan with no points, and another for a loan with 1 or more points.

7. **Question 3:** Which loan would you prefer, that is, would you buy points? Why? Insert a table or screenshot to support your findings. Are there any conditions which might change your decision?

8. Let's now consider the possibility that the mortgage could be paid off before maturity. Create a copy of your worksheet. Name the former worksheet "Held Until Maturity", and name the new worksheet "Prepayment".

9. On this new worksheet, insert three new lines: Yrs Held, Payoff Balance, and Payoff Balance, and create the formulas for the payoff balance if prepaid early. Since we are no longer holding the mortgage until maturity, you will need to adjust the formulas for the effective rates.

   - The future value is not zero

   - The number of periods is no longer the original maturity term, which is 360 in the example

Loan Information

Loan Amount	$	180,000		
Down Payment		20%		
FICO Score		740		
Loan Type	30 Year Fixed			
Term		30		
Loan Purpose	Mortgage	Mortgage or Refinance		
Yrs Held		5.2		

Loan 1) Without Points

Interest Rate (not APR)		3.875%	Source: www.bankrate.com
Fees		0	Source: www.bankrate.com
Net Loan	$	180,000	The net loan is the total loan amount minus fees and points
Payment	$	(846.43)	The lender bases the payment on the total loan amount
Payoff Balance	$	161,609.73	The balance of the loan at the end of the holding period
Effective Rate		3.875%	The effective rate is based on the net loan amount

Loan 2) With Points

Interest Rate (not APR)		3.625%	Source: www.bankrate.com
Fees		0	Source: www.bankrate.com
Points		1.10	Source: www.bankrate.com
Net Loan		178,020	The net loan is the total loan amount minus fees and points
Payment	$	(820.89)	The lender bases the payment on the total loan amount
Implied Point Deduction		0.227%	The difference in rates divided by the number of points
Payoff Balance	$	160,906.66	The balance of the loan at the end of the holding period
Effective Rate		3.870%	The effective rate is based on the net loan amount

10. **Question 4:** How does shortening your holding period for the loan, (that is refinancing or selling the house earlier), change the effective rate on the loan without points or origination fees? How does the effective rate change on the mortgage with points?

11. **Question 5:** Shorten the years held to 1 year. Which loan appears more appealing now? The loan with points or without? Why? Insert a table or screen shot to support your findings.

12. Our results from the previous step indicate that there is some break-even holding point, when points make sense to purchase. It is the point where the savings from the reduction in the interest rate pay for the original cost of the points. We will use solver, an add-in package for excel, to calculate this break even point.

    (a) Install Solver: File>Options>Add-ins>Excel Add-ins and hit "Go">Check Solver Add-in and click "OK"

13. Open the solver package under Data. We want to optimize the effective rate for the loan with points, by changing the "Yrs Held" variable.

    (a) So set the objective equal to the effective rate for the loan *with* points.

    (b) We want to set it to a value of the effective rate for the loan *without* points, which you will have to hard key in.

    (c) "Yrs Held" will be the changing variable.

    (d) The number of years held cannot be less than zero, and cannot be more than 30, so set the constraints appropriately.

    (e) Choose the Evolutionary Solving Method. Click "Options" and set the Max time to 15 seconds. Hit "OK"

    (f) Click Solve, and your "Yrs Held" variable should be set to a number which sets the two effective rates equal to each other. This is the **payback period** for the decision to buy points.

14. **Question 6:** How many years will it take the savings from the lower interest rate to pay back the initial cost of the points. Support your answer with a table or screen shot from excel.

15. Let's confirm this result with a sensitivity table. Replicate the single variable sensitivity table below, using "Yrs Held" as your independent variable, and the effective rate for the mortage with points as your response variable.

    - Use conditional highlighting to highlight the effective rates above the effective rate for the loan with no points red. Highlight the rates below green.

    - The payback period according to the sensitivity table and based off our results from solver should be consistent.

Loan Information

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Effective Rate of the Loan without Points

3.870%

Yrs Held	Rate
1	4.76%
2	4.21%
3	4.03%
4	3.93%
5	3.88%
6	3.84%
7	3.82%
8	3.80%
9	3.78%
10	3.77%
11	3.76%
12	3.75%
13	3.75%
14	3.74%
15	3.74%
16	3.73%
17	3.73%
18	3.73%
19	3.73%
20	3.72%
21	3.72%
22	3.72%
23	3.72%
24	3.72%
25	3.72%
26	3.72%
27	3.72%
28	3.72%
29	3.71%
30	3.71%

16. **Question 7:** Insert a screen shot or table from Excel similar to the screenshot above.

17. **Question 8:** What's your conclusion? Should you buy points? Manipulate some of the other inputs. What does this result appear to depend on? Explain in a few sentences.