

Fall 2005

<p style="text-align: center;"><b>FIN 4777</b> <b>Midterm (Practice) Exam 11/10/05</b></p>
--

NAME: \_\_\_\_\_  
(Please print your name here)

PLEDGE: \_\_\_\_\_  
(Sign your name here)

1. The exam is closed book and closed notes. You can bring in one page, single-sided, 8×11 formula sheet.
2. You can (and probably have to) use a calculator.
3. You have a total of 60 minutes for the exam.
4. The whole exam has a total of 25 points. It will count 25% for your final course grade. There are total of 15 multiple choices questions. Questions 1-5 are 1 point each. Question 6-15 are 2 points each.
5. Do not separate the exam book. Turn in the entire exam at the end.
6. Budgeting your time efficiently.
7. Good luck.

Please use the following table for your answer to the multiple choice questions

<b>Question</b>	<b>Answer</b>	<b>Question</b>	<b>Answer</b>	<b>Question</b>	<b>Answer</b>
<b>1</b>		<b>6</b>		<b>11</b>	
<b>2</b>		<b>7</b>		<b>12</b>	
<b>3</b>		<b>8</b>		<b>13</b>	
<b>4</b>		<b>9</b>		<b>14</b>	
<b>5</b>		<b>10</b>		<b>15</b>	
<b>Total</b>					

1. The number of periods over which the payments will be calculated given the interest rate and dollar amount of the loan is called the:
  - a. Yield to Maturity
  - b. Loan Maturity Term
  - c. Amortization Term
  - d. Prepayment Term
  
2. To a mortgage borrower, points are:
  - a. Deferred Equity
  - b. Taxable Income
  - c. Taxable Basis
  - d. Prepaid Interest
  
3. The impact of points and out of pocket costs on a borrower's effective borrowing cost is \_\_\_\_\_, the shorter the period the loan is held.
  - a. Less
  - b. More
  - c. Most often more and rarely less
  - d. Randomly more or less
  
4. The lender's process of evaluating the borrower and the property offered as security for the mortgage to determine the transaction's level of default and foreclosure risk is termed:
  - a. Over appreciating
  - b. Justifying
  - c. Underwriting
  - d. Under appreciating
  
5. The following statement is true about ARM rates:
  - a.  $\text{Contract} + \text{Spread} = \text{Index}$
  - b.  $\text{Contract} + \text{Index} = \text{Spread}$
  - c.  $\text{Contract} - \text{Spread} = \text{Index}$
  - d.  $\text{Contract} / \text{Index} = \text{Spread}$

Q6 – Q9 use the following information:

You bought a \$250,00 house 10 years ago using a 30 year FRM mortgage with

- a. 20% down payment and
- b. 6% interest rate.

You have been paying the amount according to the schedule every month.

6. How much balance do you still owe to the mortgage bank?
  - a. < \$150,000
  - b. \$150,000 - \$160,000
  - c. \$160,000 - \$170,000
  - d. > \$170,000
  
7. How much interests have you paid over the first 10 years?
  - a. < \$100,000
  - b. \$100,000 - \$110,000
  - c. \$110,000 - \$120,000
  - d. > \$120,000
  
8. What is the proportion of next (121<sup>th</sup>) payment that will go to principal payment?
  - a. 20%
  - b. 30%
  - c. 40%
  - d. 50%
  
9. If you plan to pay off the mortgage in the next 10 years, instead of 20 year, how much more than the minimum payment do you need to make each month?
  - a. < \$250
  - b. \$250 - \$500
  - c. \$500 - \$750
  - d. > \$750

10-15. You face the following two choices for a mortgage:

- A. 30 year FRM @ 8.5 % with 0 point
- B. 30 year FRM @ 8.0 % with 1.5 point

10. What is the APR for loan A?

- a. 8.0 – 8.2 %
- b. 8.2 – 8.4 %
- c. 8.4 – 8.6 %
- d. 8.6 – 8.8 %

11. What is the APR for loan B?

- a. 8.0 – 8.2 %
- b. 8.2 – 8.4 %
- c. 8.4 – 8.6 %
- d. 8.6 – 8.8 %

12. What is the effective borrowing cost if you choose loan A, but plan to stay only for 10 years?

- a. 8.0 – 8.2 %
- b. 8.2 – 8.4 %
- c. 8.4 – 8.6 %
- d. 8.6 – 8.8 %

13. What is the effective borrowing cost if you choose loan B, but plan to stay only for 10 years?

- a. 8.0 – 8.2 %
- b. 8.2 – 8.4 %
- c. 8.4 – 8.6 %
- d. 8.6 – 8.8 %

14. Which loan would you choose if you only plan to stay for 10 years?

- a. Loan A
- b. Loan B
- c. Indifferent
- d. Not enough information

15. Which loan would you choose if you only plan to stay for 2 years?

- a. Loan A
- b. Loan B
- c. Indifferent
- d. Not enough information

- 16-17. The market rate for a 30 FRM is 9.5%. A developer approached your bank for a mortgage buy down proposal, and wants to offer his home buyer an 8% borrowing rate.
16. Assuming average loan will be paid off in 10 years, what is the point that you need to charge the developer?
- 0 – 5%
  - 5 – 10%
  - 10 – 15%
  - 15 – 20%
17. The developer offers you the financing deal for a \$250,000 loan. If you have the cash and do not need the financing, what is the amount of discount on sale price that you expect that the developer is willing to offer?
- \$0 - \$10,000
  - \$10,000 - \$20,000
  - \$20,000 - \$30,000
  - \$30,000 - \$40,000
18. You borrowed a 30 year FRM 5 years ago at 6 %. You still owe \$500,000 for the mortgage. The loan has 25 years left on its term. Now the market interest rate has dropped to 5.5% for a 25-year FRM. If you plan to stay in the house for another 5 years, and refinancing costs you \$5,000, do you want to refinance?
- Yes
  - No
  - Indifferent
  - Not enough information
19. If a bank offers you a no-cost refinance at 5.875%, do you want to refinance?
- Yes
  - No
  - Indifferent
  - Not enough information
20. Review question 8 – 15 in the practice quiz. See HW1 solution for details.

*Suggested Solutions: CDBCC CCBCC ACBBA BCAA*

*Detailed solutions on numerical questions for numerical questions:*

Q6. First find out payment when contract is initiated

$$\$250,000 * (1-20\%) = PMT / (6\% / 12) * [1 - 1/(1+6\%/12)^{360}] \rightarrow PMT = \$1,199$$

Then the balance after 10 years are

$$1199 * (6\% / 12) / [1 - 1/(1+6\%/12)^{240}] = \$167,391$$

Q7. Total payment over the first 10 years are:

$$\$1,199 * 120 = \$143,892$$

Out of the total payment, the amount of principal payments are

$$\$200,000 - \$167,391 = \$32,609$$

Hence the interest payment over the first 10 years is

$$\$143,892 - \$32,609 = \$111,283$$

Q8. The interest payment for the next payment is

$$\$167,391 * (6\% / 12) = \$837$$

which implies principal payment of

$$\$1,199 - \$837 = \$362$$

I.e. about

$$\$362 / \$1199 = 30\%$$

of your payment will go to principal.

Q9. If you want to pay off in 10 years, then

$$\$167,391 = PMT / (6\% / 12) * [1 - 1/(1+6\%/12)^{120}] \rightarrow PMT = \$1,858$$

In other words,

$$\$1,858 - \$1,199 = \$659$$

more.

10. For loans without point, APR = contract rate

11. Assume a loan of \$100,000. Time 0 net cash flow is

$$\begin{aligned} & \$100,000 - \$100,000 * 1.5\% = \$98,500 \\ & \text{Payment for loan B is} \end{aligned}$$

$$\$100,000 * (8\% / 12) / (1 - 1 / (1 + 8\% / 12)^{360}) = 733.76$$

Set the equation for effective borrowing cost with 1.5 points and 30 year tenure

$$\$98,500 = 733.76 / (r_E / 12) * (1 - 1 / (1 + r_E / 12)^{360})$$

and solve for  $r_E$ .  $\rightarrow r_E = 8.16\%$

12. When points = 0,  $r_E = \text{APR} = \text{contract rate}$ .

To see that first find out mortgage payment for loan A:

$$\$100,000 * (8.5\% / 12) / (1 - 1 / (1 + 8.5\% / 12)^{360}) = 768.91$$

Find out mortgage OLB after 10 years

$$\text{OLB}_{120} = 768.91 / (8.5\% / 12) * (1 - 1 / (1 + 8.5\% / 12)^{240}) = 88,602.55$$

Then set the equation for effective borrowing cost with points = 0

$$\$100,000 = 768.91 / (r_E / 12) * (1 - 1 / (1 + r_E / 12)^{360})$$

and solve for  $r_E$ .  $\rightarrow r_E = 8.50\%$

13. Find out OLB for mortgage B after 10 years

$$\text{OLB}_{120} = 733.76 / (8.0\% / 12) * (1 - 1 / (1 + 8.0\% / 12)^{240}) = 87,724.7$$

Set the equation for effective borrowing cost with 1.5 points and 10 year expected tenure

$$\begin{aligned} \$98,500 = & 733.76 / (r_E / 12) * (1 - 1 / (1 + r_E / 12)^{120}) \\ & + 87,724.7 / (1 + r_E / 12)^{120} \end{aligned}$$

and solve for  $r_E$ .  $\rightarrow r_E = 8.23\%$

14. compare effective rate and choose B

15. For loan without points, effective rate is still 8.5%. For loan B, repeat step 13 with 2 year expected stay.

Find out OLB for mortgage B after 2 years

$$OLB_{120} = 733.76 / (8.0 \% / 12) * (1 - 1/(1 + 8.0 \% / 12)^{12*(30-2)}) = 98,259.9$$

Set the equation for effective borrowing cost with 1.5 points and 10 year expected tenure

$$\begin{aligned} \$98,500 = & 733.76 / (r_E / 12) * (1 - 1/(1 + r_E / 12)^{12*(30-2)}) \\ & + 98,259.9 / (1 + r_E / 12)^{12*(30-2)} \end{aligned}$$

and solve for  $r_E$ .       $\rightarrow r_E = 8.83\%$ .

So choose loan A this time.

16. Assume the loan has a balance of \$100,000. We first find out mortgage payment under 8% contract rate. PMT = \$733.76 (same as loan B in question 11).

Next find out balance by the end of the 10 year.  $OLB_{120} = \$ 87,724.7$  as in Question 13 for loan B.

We are solving for points in the following present value equation

$$\begin{aligned} \$100,000 - \text{Points} = & 733.76 / (9.5\% / 12) * (1 - 1/(1 + 9.5\% / 12)^{120}) \\ & + 87,724.7 / (1 + 9.5\% / 12)^{120} \end{aligned}$$

and solve for points       $\rightarrow$       points = \$9,240, or 9.24%

17. The builder is paying 9.24 points. So for a \$250,000 loan, he pays

$$\$250,000 * 9.24\% = \$23,100$$

This is the amount that builder is willing to negotiate.

18. The existing loan is 6% contract rate, but with no point  
The refinancing loan is 5.5%, but with  $\$5,000 / \$500,000 = 1\%$  or 1 point.

The refinancing decision boils down to which loan has the lower effect rate if you plan to stay for 5 more years.

If not refinancing, the effective rate with the existing loan is 6% (since there is points / refinancing charges)

If switching to the new loan of the same balance, yet with \$5,000 points (refi charge), then

First find out PMT = \$3,070.44 at 5.5% for a 30 year loan

Then find out balance in 5 years = \$446,357.6

Last set up PV equation to find out effective yield for a 25 year loan with 5 years early mortgage termination

$$\begin{aligned} \$500,000 - \$5,000 = & 3,070.44 / (r_E / 12) * (1 - 1/(1 + r_E / 12)^{60}) \\ & + 446,357.6 / (1 + r_E / 12)^{60} \end{aligned}$$

and solve for  $r_E$ .       $\rightarrow$        $r_E = 5.74 \%$

Hence one should refi. Alternatively you can calculate the difference in payments and the difference in OLB upon moving and discount them at 5.5% market rate. Then compare the PV of savings with refi cost.

19. For a no-cost refi, the effective yield is the same as the contract rate. So definitely refi