

Homework 6 – Due December 3, in class.

Presentation will count for 5 points.

Problem 1 (22 pts), refinancing

Consider a 15-year FRM mortgage with initial balance \$100,000, monthly payment, full amortization and contract rate of 10%. At the end of year 5 (after 60 payments have been made), rates on 10-year mortgages are 9.5%. Refinancing carries a total (fixed) cost of \$1000.

1. Assuming that the borrower will have no other opportunity to refinance their mortgage, should the borrower refinance the loan?
2. When the first loan was originated, the lender offered a contract with 2 points and the same APR (10%). Had the borrower opted for that mortgage, would refinancing make sense after 5 years? Show your work.
3. Consider once again the loan with no points. Assume this time that the borrower has the option to refinance at any point, and that this option has value \$5000 after 5 years. How low must rates be after 5 years for refinancing to have a positive NPV?

Problem 2 (23 pts), default pricing

A lender is considering issuing a 3-year FRM with yearly payments and initial balance \$100,000. The lender expects that the default hazard rate on the mortgage is 2% in each year plus $\frac{m}{40,000}\%$ where m is the size of the payment. In the event of default, the lender loses half of the loan's outstanding principal plus unpaid interest (= the loss severity rate is 50%).

1. What contract rate must the lender set to hit an IRR target of 9% on this loan?
2. Given this contract rate, calculate the conditional yield degradation for each year, and the expected yield degradation for the overall loan.
3. The lender now wants to hit the same IRR target, but by using a contract rate of 9% with points. How many points must it charge the borrower to hit this target? (To keep the problem simple, assume that the lender can charge points in whatever fraction she wants, she is not restricted to whole points.)