

**Finance 462**  
**Problem Set #9**

- 1) Suppose that the demand for loans depends on the annual interest rate charged ( $r_l$ ), the annual fees charged ( $F$ ), and the unemployment rate. Each loan is a \$100,000, 30 year fixed APR mortgage.

$$Q = 125 - 624r_l - .026F - 90.4UR$$

The bank has a monthly fixed cost of \$10,000 plus an annual variable cost (interest paid on deposits plus various administrative expenses equal to 5% of the loans created)

- a) Suppose that the bank charges nothing in fees. Solve for the profit maximizing interest rate. What are the banks monthly profits?
  - b) Calculate the interest elasticity of loan demand at the profit maximizing point.
  - c) Now, suppose that the bank decides to charge \$1200 per year in Fees. Calculate the bank's profit maximizing interest rate and monthly profits.
  - d) How would (c) change if the Fee were a one time (i.e. closing costs)?
- 2) Suppose that bank tellers unite to form a labor union. As a result, wages paid to bank tellers rise dramatically.
- a) Explain using diagrams how this would influence loan rates if the banking industry were monopolistic.
  - b) How would your answer change if the banking industry were perfectly competitive?
- 3) In late 1999, the threat of Y2K loomed large. Banks (along with everyone else) scrambled to make sure their computers were Y2K compliant. Assume that this expense is a fixed cost (i.e. not dependant on the size of the bank).
- a) Explain using diagrams how this would impact loan rates in a monopolistic banking industry.
  - b) How would your answer change if the banking industry were perfectly competitive?
- 4) Suppose that you are the manager of a bank. You currently have \$250,000 in Deposits (\$200,000 in checking accounts, \$50,000 in savings accounts), \$15,000 in cash reserves, \$160,000 in Short Term Commercial Loans and \$100,000 in short term government securities. The reserve requirement is 5% of deposits and the minimum equity capital requirement is 4% of non-cash assets.
- a) What is your current level of excess reserves? What is your current level of equity?
  - b) Suppose that the interest rate on Government securities is 3%, the interest rate charged to your outstanding loans is 7%, the interest paid on savings

accounts is 2% and checking accounts earn no interest. What is your profit? What is your return on assets? What is your return on equity?

- c) Suppose that \$10,000 is withdrawn from one of your checking accounts. How should you respond to this?
  - d) Suppose that a \$30,000 loan defaults. How should you respond to this?
- 5) Suppose that you are the manager of a bank. Your bank currently has \$100,000 worth of deposits in checking accounts, \$50,000 in 1 yr. CDs (these will require a payout of \$52,500 one year from now) and \$20,000 in 2 year CDs (these will require a payout of \$20,808 two years from now). You have \$18,000 cash in the vault, \$90,000 in loans due in 1 year (these will generate \$94,500 in revenues in 1 year) and \$80,000 in loans due in 2 years (these will generate \$88,200 in two years). For simplicity, assume the interest rate is currently 5%. Set up the T-accounts for your bank and explain how each of the following events would affect your assets, liabilities and net worth?
- e) One of your depositors closes his \$10,000 checking account.
  - f) \$20,000 of your 2-year loans defaults.
  - g) The market interest rate rises from 5% to 8%. (Note: to answer this, you will have to calculate your duration gap!)