

EC303: Money and Banking

Worksheet 6

Exercise 1

Using the *t*-accounts of the first national bank and the second national bank given in this chapter, describe what happens when Lucy writes a \$50 check on her account at the First National Bank to pay her friend Tom, who in turn deposits the check in his account at the Second National Bank.

Answer:

First National Bank			
Assets		Liabilities	
Reserves	-\$50	Checkable Deposits	-\$50

Second National Bank			
Assets		Liabilities	
Reserves	\$50	Checkable Deposits	\$50

Exercise 2

If the bank you own has no excess reserves and a sound customer comes in asking for a loan, should you automatically turn the customer down, explaining that you don't have any excess reserves to lend out? Why or why not? What options are available for you to provide the funds your customer needs?

Answer: The bank can borrow at the discount window or in the federal funds market, or it can acquire funds by issuing negotiable CDs.

Exercise 3

If a bank doubles the amount of its capital and ROA stays constant, what will happen to ROE? Hint: $ROE = ROA \times EM$.

Answer:

Given the ROA, if bank capital doubles, then ROE will fall by half.

$$ROA = \frac{NPAT}{Assets}$$

$$ROE = \frac{NPAT}{Equity\ capital}$$

$$EM = \frac{Assets}{Equity\ capital}$$

Exercise 4

Harbert Bank holds no excess reserves but complies with the reserve requirement. The required reserves ratio is 8%, and reserves are currently \$25 million

1. Calculate the checkable deposit amount.

Answer: \$312.5 million ($25/0.08$)

2. If there is a \$4m deposit outflow, what is the reserve shortage? Answer: \$3.68 million

3. Assume the federal funds rate is 0.3%. If the bank borrows from the Federal funds market to eliminate the reserves shortfall, what is the interest cost? Answer: \$11,040

Exercise 5

Suppose you are the manager of a bank whose \$100 million of assets have an average duration of four years and whose \$90 million of liabilities have an average duration of six years. Conduct a duration analysis for the bank, and show what will happen to the net worth of the bank if interest rates rise by 2 percentage points. What actions could you take to reduce the bank's interest-rate risk?

Answer:

The assets fall in value by \$8 million ($= \$100 \text{ million} \times -2\% \times 4 \text{ years}$) while the liabilities fall in value by \$10.8 million ($= \$90 \text{ million} \times -2\% \times 6 \text{ years}$). Because the liabilities fall in value by \$2.8 million more than the assets do, the net worth of the bank rises by \$2.8 million.

The interest-rate risk can be reduced by shortening the maturity of the liabilities to a duration of four years or lengthening the maturity of the assets to a duration of six years. Alternatively, you could engage in an interest-rate swap, in which you swap the interest earned on your assets with the interest on another bank's assets that have a duration of six years.

Exercise 6

Suppose you are the manager of a bank that has \$15 million of fixed-rate assets, \$30 million of rate-sensitive assets, \$25 million of fixed-rate liabilities, and \$20 million of rate-sensitive liabilities. Conduct a gap analysis for the bank, and show what will happen to bank profits if interest rates rise by 5 percentage points. What actions could you take to reduce the bank's interest-rate risk?

Answer:

The gap is \$10 million (\$30 million of rate-sensitive assets minus \$20 million of rate-sensitive liabilities). The change in bank profits from the interest rate rise is +\$0.5 million ($5\% \times \10 million); the interest-rate risk can be reduced by increasing rate-sensitive liabilities to \$30 million or by reducing rate-sensitive assets to \$20 million. Alternatively, you could engage in an interest-rate swap in which you swap the interest on \$10 million of rate-sensitive assets for the interest on another bank's \$10 million of fixed-rate assets.