Mini-case 11: Calculating and Comparing Gap, Duration, and Risk Management Alternatives

CONCEPTS IN THIS CASE

interest-rate risk
duration gap analysis
income gap analysis
minimizing risk of market value
interest-rate sensitive assets and liabilities

Your employer has asked you to examine the interest-rate risk of your bank relative to your direct competition. Management is concerned that interest rates will fall by the end of the year and wants to see what would happen to the relative profitability of the firm if the decline actually occurs.

Interest-rate risk depends on each bank's relative position of interest-sensitive assets and liabilities. You begin the analysis by collecting the information and estimates.

Bank Balance Sheet

	Your Firm		Competition	
	Amount ($millions)	Duration (years)	Amount ($millions)	Duration (years)
Assets				
Reserves and cash items	3	0.0	4	0.0
Securities				
Less than 1 year	4	0.6	5	0.3
1–2 years	3	1.6	7	1.2
Greater than 2 years	7	5.0	9	4.0
Residential mortgages				
Variable-rate	9	0.4	21	0.9
Fixed-rate (30 years)	15	5.5	17	4.4
Commercial loans				
Less than 1 year	13	0.9	30	0.6
1–2 years	31	1.8	22	1.4
Greater than 2 years	55	6.0	30	5.4
Physical capital	10	0.0	25	0.0
Liabilities				
Chequable deposits	10	1.0	14	1.0
Money market deposit accounts	5	0.6	9	0.5
Savings deposits	12	1.0	16	1.0
CDs				
Variable-rate	6	0.4	12	0.6
Less than 1 year	19	0.3	14	0.5
1–2 years	8	1.1	10	1.8
Greater than 2 years	15	2.9	10	2.2
Overnight funds	10	0.0	14	0.0
Borrowings				
Less than 1 year	12	0.4	18	0.7
1–2 years	9	1.2	12	1.8
Greater than 2 years	39	2.9	31	3.8

To prepare your presentation for the bank officers, you anticipate and answer the following questions:

1. What is the total for interest-rate-sensitive assets for
   a. Your firm?
   b. Your competition?
2. What is the total for interest-rate-sensitive liabilities for
   a. Your firm?

b. Your competition?

3. If interest rates decline by 3%
   a. What will be the estimated net interest margin for your firm?
   b. What will be the estimated net interest margin for your competition?
4. Compare the estimated relative success of your bank and your competition if interest rates
   a. Decline by 3%
   b. Increase by 3%
5. What is the gap of
   a. Your firm?
   b. Your competition?
6. Using the Macaulay concept of duration, calculate the weighted duration of each asset and liability for both your firm and your competition.
7. What is the average duration for
   a. Assets for your firm?
   b. Assets for your competition?
   c. Liabilities for your firm?
   d. Liabilities for your competition?
8. What is the duration gap for
   a. Your firm?
   b. Your competition?
9. Using the net worth formula if interest rates decline by 3%, what will be the expected change in the market value of net worth for
   a. Your firm?
   b. Your competition?
10. Using the net worth formula, if interest rates rise by 3%, what will be the expected change in the market value of net worth for
    a. Your firm?
    b. Your competition?
11. What would your firm need to do
    a. To eliminate the income gap using adjustments to rate-sensitive assets?
    b. To immunize the market value of net worth from interest-rate risk using duration?