

## Setul 1: Analiza gradului de expunere la riscul de dobândă prin metoda GAP

- Evaluate the prices of the following pure discount (zero-coupon) bonds:
  - \$1,000 face value received in five years, yielding an annual rate of 8 percent.
  - \$10,000 face value received in three years, yielding an annual rate of 6 percent.
  - \$100,000 face value received in 10 years, yielding an annual rate of 13 percent.
  - \$1,000,000 face value received in two years, yielding an annual rate of 7 percent.
  - \$1,000,000 face value received in six months, yielding an annual rate of 7 percent.
- Calculate the value of each bond in Question 1 if all yields increased by 1 percent.
- Calculate the percentage price changes for each bond in Question 1 if all yields increased by 1 percent (as in Question 2).
- What can you conclude about bond price volatility from your answer to Question 3?
- If the bonds in Question 1 were coupon instruments selling at par, calculate the annual coupon payment for each bond.
- Calculate the prices of each coupon bond in Question 5 if all yields increased by 1 percent.
- Calculate the percentage price changes for each bond in Question 6 if all yields increased by 1 percent. (Recall that the coupon bonds were originally priced at par.)
- Compare your answers to Questions 3 and 7. What can you conclude about bond price volatility?
- Consider a five-year coupon bond with a face value of \$1,000 paying an annual coupon of 15 percent.
  - If the current market yield is 8 percent, what is the bond's price?
  - If the current market yield increases by 1 percent, what is the bond's new price?
  - Using your answers to Parts a and b, what is the result of the 1 percent increase in interest rates?
- Compare your answers to Questions 3, 7, and 9. What can you conclude about bond price volatility?
- Calculate the repricing gap and impact on net interest income of a 1-percent increase in interest rates for the following positions:
  - Rate-sensitive assets = \$100 million, rate-sensitive liabilities = \$50 million.
  - RSA = \$50 million, RSL = \$150 million.
  - RSA = \$75 million, RSL = \$70 million.
  - Compare the interest rate risk exposure of the institutions in Parts a, b, and c.
- Use the following data to answer Parts a through c.
 

Givebucks Bank, Inc. (\$ millions)			
Assets		Liabilities	
Rate-sensitive	\$50	Rate-sensitive	\$70
Fixed rate	50	Fixed rate	20
		Equity	10

Notes: All RSAs currently earn 10 percent interest per annum. All fixed-rate assets earn 7 percent per annum. RSLs currently pay 6 percent per annum, while fixed-rate liabilities offer 6 percent.

  - What is Givebucks Bank's current net interest income?
  - What will the net interest income be if interest rates increase by 2 percent?
  - What is Givebucks' repricing or interest rate gap? Use it to check your answer to Part b.
  - Why might Givebucks' change in NII differ from that predicted by gapping?
- Use the following information about a hypothetical government security dealer named J. P. Mersal Citover to answer Parts a and b. (Market yields are in parentheses.)
 

J. P. Mersal Citover (\$ millions)			
Assets		Liabilities	
Cash	\$ 10	Overnight repos	
T-bills: 30-day		(7.00%)	\$170
(7.05%)	75	Subordinated debt:	
T-bills: 91-day		Seven-year fixed at	
(7.25%)	75	(8.55%)	150
		Equity	15
Government notes:			
Two-year (7.50%)	50		
Canada bonds: 10-year			
(8.96%)	100		
Municipal notes:	25		
Five-year quarterly			
floating rate (8.20%)			

  - What is the repricing or interest rate gap if the planning period is 30 days? 91 days? Two years? (Recall that cash is a noninterest-earning asset.)
  - Use gapping to estimate the impact over the next 30 days on net interest income if all interest rates rise by 50 basis points.
  - If the 50-basis-point increase in b were the only change in interest rates during the year, would you expect the actual change in annual NII to be as calculated in b? Why not?

14. Assume a planning period of 120 days when answering Parts *a* through *e*.

<i>Assets</i>	<i>Rate</i>
30-year, fixed-rate mortgages: \$11 million	10%
90-day, fixed-rate loans: \$35 million	9%
Property: \$4 million	
<i>Liabilities and Equity</i>	
Demand deposits: \$12 million	0%
Interbank borrowings (with maturities less than 90 days): \$30 million	7%
Equity: \$8 million	

- Calculate this bank's repricing gap.
  - What is the bank's annual net interest income, assuming that all rates stay constant and the principals of all assets and liabilities are rolled over on maturity?
  - Suppose that all interest rates decrease by 50 basis points over the planning period. What will be the impact on net interest income?
  - Suppose that all interest rates increase 1 percent over the planning period. What will be the impact on net interest income?
  - What is the bank's interest rate risk exposure? How can the bank protect itself from unanticipated reductions in net interest income?
15. *Challenge Question*
- Spot rates are  
 One-year CD: 7.80%  
 Two-year CD: 7.95%  
 One-year municipal note: 7.95%  
 Two-year municipal note: 8.15%  
 Overnight interbank rates: 8.075%
- Using the preceding term structure, describe the leveraged transaction with the highest interest spread. (Recall that a typical transaction for an FI consists of the simultaneous purchase of an interest-earning asset financed with the issuance of a financial liability.)
  - What is the interest rate risk exposure of the transaction in Part *a*?
  - If all interest rates increase 50 basis points at the end of one year, what are the cash flows at the end of each of the first and second years? (Hint: Use implied forward rates to form expectations about future spot rates for one-year CDs.)
  - List two transactions that have no interest rate risk exposure. What are the cash flows over the life of the investment?