## Mini-case 12: Micro Hedge, Macro Hedge, Managing Interest-Rate Risk, Market Value

## CONCEPTS IN THIS CASE

forward contracts long position short position hedge financial futures contract arbitrage micro hedge macro hedge cross hedge hedge ratio basis risk stock market risk portfolio insurance

Your company president is concerned about the effect of interest-rate changes on rate-sensitive assets and liabilities. You have presented an analysis of both the income and the duration gap of the firm and how this would result in changes in the market value of the bank's net worth. This presentation made it clear that the bank needs to hedge against an adverse change in the market value of net worth. Based on economic forecasts, it is most likely that interest rates will rise in the next six months.

As a result of the excellent work you presented to management regarding gap analysis, you have been called on again to present alternatives that will manage this inherent risk. You see this as a way to learn more about the key management concerns of banks and to hone a fine presentation. However, you are not sure about these "hedging" concepts, so you seek out professionals in the area and begin to focus entirely on how these tools work.

Your professional "coach" in this area is Bob R. Smart. He has worked for many years setting up and managing hedging strategies. You are not intimidated by his experience, but you are interested in making a good first impression. With this in mind, you create a glossary for basic hedging methods, including forward contracts, interest-rate forward contracts, long position, short position, hedge, financial futures contract, arbitrage, micro hedge, macro hedge, cross hedge, hedge ratio, basis risk, stock market risk, and portfolio insurance.

Bob has asked you to bring your bank's current list of assets and liabilities to the study session to use in setting up both a micro and a macro hedge. A summary of your bank's position is as follows:

Total assets: \$150 million

Duration gap: 2.20 years

Primary holdings of concern: \$7 million in 6% Canada bonds selling at par that will mature in 5 years; \$12 million in stocks with an average beta of 0.90

Your assignment after the first study session is to set up a micro hedge for the Canada bonds that will help the bank offset the adverse effect of interest-rate increases on the bonds being held and to set up a macro hedge that will minimize any negative effect on the market value of net worth when interest rates rise.

You gather information from the most recent financial press regarding Canada bond contracts with a maturity of about one year. Historical relationships between Canada bond futures contracts and Canada bonds indicate that the change in the value of the hedged asset relative to the futures contract would be about 1.3 and that interest rates on the hedged asset change on average for a given change in the interest rate on the futures contract by about 0.90. A 1% increase in interest rates results in a decline in value for Canada bonds of 8% of par.

1. If you expect interest rates to rise, what type of hedge should you set up, long or short?

2. What is the hedge ratio for the micro hedge?

3. How many futures contracts are needed to set up a complete hedge?

4. If interest rates on the Canada bonds rise by 1%, what would be the change in the value of the bank's

a. Canada bonds?

b. Canada bond futures contracts?

5. If the bank can set up \$150 million in futures contracts whose underlying bonds have an average duration of 2.20 years, what would be the change in the value of the bank's

a. Market value of net worth (without the futures contracts)?

b. Macro hedge position?

c. Market value of net worth (including the effects of the futures contracts)?

6. If the bank cannot find a set of futures contracts with the same duration as the bank (2.20 years) but has found enough contracts with a duration of 4.40 years,

a. How much of this contract would the bank sell?

b. For a 1% increase in interest rates, what would be the percentage change in the price of the futures contract?

c. What would be the decline in the market value of the bank's net worth without the futures contract in place?

d. What would be the change in the market value of the bank's net worth with the futures contract in place?

7. How could basis risk result in eliminating the forecasted success of the hedge positions described above?

8. Identify the generally accepted accounting principles that would influence your decision to use hedging strategies.

9. If on January 5 you see June TSX/S&P Index contracts selling for 800, how many contracts must the bank sell to immunize its portfolio against systematic (market) risk?

10. If the TSX/S&P falls by 10% between January 5 and June, what will be the change in

- a. The market value of the bank's stocks?
- b. The market value of the bank's index contracts described in Question 9?
- c. The market value of the firm's net worth?

11. Explain how the bank would make use of forward contracts to hedge foreign exchange rate risk if they anticipate an increase in the value of the dollar relative to a foreign currency over the next six months.

12. Explain how the bank would make use of futures contracts to hedge foreign exchange rate risk if they anticipate a decrease in the value of the dollar relative to a foreign currency over the next six months.

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