

- 4 For a number of years Daikon Co has been using forward rate agreements to manage its exposure to interest rate fluctuations. Recently its chief executive officer (CEO) attended a talk on using exchange-traded derivative products to manage risks. She wants to find out by how much the extra cost of the borrowing detailed below can be reduced, when using interest rate futures, options on interest rate futures, and a collar on the options, to manage the interest rate risk. She asks that detailed calculations for each of the three derivative products be provided and a reasoned recommendation to be made.

Daikon Co is expecting to borrow \$34,000,000 in five months' time. It expects to make a full repayment of the borrowed amount in 11 months' time. Assume it is 1 June 2015 today. Daikon Co can borrow funds at LIBOR plus 70 basis points. LIBOR is currently 3.6%, but Daikon Co expects that interest rates may increase by as much as 80 basis points in five months' time.

The following information and quotes from an appropriate exchange are provided on LIBOR-based \$ futures and options.

Three-month \$ December futures are currently quoted at 95.84. The contract size is \$1,000,000, the tick size is 0.01% and the tick value is \$25.

Options on three-month \$ futures, \$1,000,000 contract, tick size 0.01% and tick value \$25. Option premiums are in annual %.

December calls	Strike price	December puts
0.541	95.50	0.304
0.223	96.00	0.508

Initial assumptions

It can be assumed that settlement for both the futures and options contracts is at the end of the month; that basis diminishes to zero at a constant rate until the contract matures and time intervals can be counted in months; that margin requirements may be ignored; and that if the options are in-the-money, they will exercised at the end of the hedge instead of being sold.

Further issues

In the talk, the CEO was informed of the following issues:

- (i) Futures contracts will be marked-to-market daily. The CEO wondered what the impact of this would be if 50 futures contracts were bought at 95.84 on 1 June and 30 futures contracts were sold at 95.61 on 3 June, based on the \$ December futures contract given above. The closing settlement prices are given below for four days:

Date	Settlement price
1 June	95.84
2 June	95.76
3 June	95.66
4 June	95.74

- (ii) Daikon Co will need to deposit funds into a margin account with a broker for each contract they have opened, and this margin will need to be adjusted when the contracts are marked-to-market daily.
- (iii) It is unlikely that option contracts will be exercised at the end of the hedge period unless they have reached expiry. Instead, they more likely to be sold and the positions closed.

Required:

- (a) **Based on the three hedging choices available to Daikon Co and the initial assumptions given above, draft a response to the chief executive officer's (CEO) request made in the first paragraph of the question.** (15 marks)
- (b) **Discuss the impact on Daikon Co of each of the three further issues given above. As part of the discussion, include the calculations of the daily impact of the mark-to-market closing prices on the transactions specified by the CEO.** (10 marks)

(25 marks)