

**Question**

The loss of the financial institution equals the value of the swap contract before the exchange of payments on February 5, 2005. Let  $B_{\text{FIX}}$  and  $B_{\text{FLOAT}}$  respectively denote the values of what the financial institution pays and receives from February 2005 to February 2007 according to the swap contract. After the exchange of payments, the value  $B_{\text{FLOAT}}$  of the floating-rate bond would equal the notional principal of the swap, whereas the fixed-rate bond would value

$$\begin{aligned} B_{\text{FIX}} &= \frac{600,000}{2} \left( e^{-\frac{1}{2} \cdot 0.062} + e^{-0.062} + e^{-\frac{3}{2} \cdot 0.062} \right) + \left( 10,000,000 + \frac{600,000}{2} \right) e^{-2 \times 0.062} \\ &= 300,000 \left( e^{-0.031} + e^{-0.062} + e^{-0.093} \right) + 10,300,000 e^{-0.124} \\ &= \$9,944,977.95 \end{aligned}$$

After the exchange of payments, the swap contract would then value

$$B_{\text{FLOAT}} - B_{\text{FIX}} = \$10,000,000 - \$9,944,977.95 = \$55,022.05$$

for the financial institutional. However, as the firm's default happens before the exchange of the payments, we must subtract the net value of what the financial institution would pay to the firm on February 5, 2005. The value of the swap contract before the exchange of payments thus is

$$\$55,022.05 - \$300,000 + \$10,000,000 \left( e^{\frac{1}{2} \cdot 0.062} - 1 \right),$$

and hence the loss of the financial institution amounts to about \$69,877.