

## Reconciliations and investigations

### RCN 1

$$\text{EUR } 10,000,000 \times \frac{3}{360} \times 0.04 + \text{EUR } 10,000,000 \times 1 = \text{EUR } 13,333$$

### RCN 2

$$(\text{10,000,000} \times \frac{6}{360} \times 0.03) / 1.6500 = \text{GBP } 3,030$$

### RCN 3

$$50,000,000 \times 0.0090 \times \frac{3}{360} + 100 = 3,850$$

## Foreign Exchange

### FX 1

$$12,000,000.00 \times 0.9325 = \text{CHF } 11,190,000.00$$

### FX 2

$$25,000,000 \times 1.5680 = \text{USD } 39,200,000$$

### FX 3

You have sold and bought 10 million USD means that you pay 10,000,000 USD now and receive them back in the far leg

### FX 4

$$1/1.0960 - 1/1.0950 = 0.9124 - 0.9132$$

### FX 5

Buy CHF means selling CHF. As a market user you will be quoted the bid rate 0.7040, therefore you have to sell  $10,000,000 / 0.7040 = \text{AUD } 14,204,545$

### FX 6

Buy JOD is the same as selling USD. As a market maker you will be quoted the bid rate, therefore you have to sell  $5,000,000 / 0.7050 = 7,092,198$

### FX 7

As a market user you buy Japanese Yen 120,000,000 against Swiss francs . How many Swiss francs do you pay if CHF/JPY is quoted to you 110.50 - 60? = CHF 1,085,972.85

### FX 8

$$5,000,000 / 727,500,000 = 0.1818$$

### FX 9

$$15,000,000.00 \times 1.2950 = 19,425,000.00$$

### FX 10

You have bought 10M EUR at 1.3650 that you sell at 1.3638. Your loss is  $10,000,000 \times (1.3650 - 1.3638) = \text{EUR } 12,000$

### FX 11

You have sold EUR 10 million against GBP at 0.6712 that you now can buy at 0.6729. Your loss is  $10,000,000 \times (0.6712 - 0.6729) = \text{GBP } 17,000$

**FX 12**

Buy 4, sell 5, buy 3 = long 2

Average rate =  $(4 \times 1.452 - 5 \times 1.4474 + 3 \times 1.4321) / (4 - 5 + 3) = 1.4203$

**FX 13**

Position:  $+4 - 5 - (3,982,500 / 1.3275) + 9,326,100 / 1.3323 = 4 - 5 - 3 + 7 = 3$

Average rate:  $(4 \times 1.32345 - 5 \times 1.3308 - 3 \times 1.3275 + 7 \times 1.3323) / 3 = 1.3292$

**FX 14**

The salesman has still to buy GBP 4,000,000 at USD 1.5500 and the trader has to sell GBP 8,000,000 at 1.5200 whilst he had bought these at 1.5500.

Result:  $8,000,000 \times 0.0300 = \text{USD } 240,000$  loss

**FX 15**

He has bought 20M EUR in the first leg and sold 20M EUR in the second leg. In return he expects  $20\text{M} \times 0.8890 = 17,780,000$  in the far leg

**FX 16**

$-(50,000,000 / 32.50) + (50,000,000 / 34.00) = \text{USD } 78,873,30$

You did not have to calculate at all. After all, in the NDF you sold USD and the rate went up. This means that you made a loss and further you know that NDFs are always settled USD or EUR.

## Money Market

### MM 1

$$3.10\% + 20/30 \times (3.25 - 3.10) = 3.20\%$$

### MM 2

$$\text{GBP } 5,000,000 \times (1 + 5/365 \times 0.023) = \text{GBP } 5,001,890.41$$

### MM 3

$$83,333.33 / 10,000,000 \times 360/60 = 0.05$$

### MM 4

$$\text{AUD } 50,000,000 \times (1 + 3/365 \times 0.045) = \text{AUD } 50,024,986$$

### MM 5

$$\text{USD } 10,000,000 / (1 + 61/360 \times 0.0375) = \text{USD } 9,936,859$$

### MM 6

$$151,667 / 20,000,000 \times 360/61 = 0.0448$$

### MM 7

$$3.60 + 10/30 \times (0.0375 - 0.0360) = 0.0365$$

### MM 8

$$\text{USD } 5,000,000 / (1 + 87/360 \times 0.0426) = \text{USD } 4,949,050$$

### MM 9

$$\text{CHF } 15,000,000 \times (1 + 3/360 \times 0.0125) = \text{CHF } 15,001,562.50$$

### MM 10

$$\text{GBP } 20,000,000 (1 + 90/365 \times 0.03) / (1 + 30/365 \times 0.004) = \text{GBP } 20,081,922.45$$

### MM 11

$$29,275 / 5,000,000 \times 360/91 = 0.0254$$

### MM 12

$$\text{ZAR } 25,000,000 \times (1 + 183/365 \times 0.05) = \text{ZAR } 25,626,712.33$$

## Derivatives

### DER 1

$$(\text{GBP } 5,000,000 \times (0.0180 - 0.0230) \times 90/365) / (1 + 90/365 \times 0.0180) = \text{GBP } 6,137.15$$

### DER 2

$$(\text{USD } 100,000,000 \times (0.0089 - 0.0079) \times 182/360) / (1 + 182/360 \times 0.0089) = \text{USD } 50,329$$

### DER 3

$$(\text{NOK } 40,000,000 \times (0.0375 - 0.0365) \times 90/360) / (1 + 90/360 \times 0.0365) = \text{NOK } 9,909.58$$

### DER 4

$$\text{EUR } 100,000,000 \times (0.0575 - 0.0475) \times 1/2 = \text{EUR } 500,000$$

### DER 5

$$(\text{EUR } 10,000,000 \times (0.0470 - 0.0450) \times 91/360) / (1 + 91/360 \times 0.0470) = \text{EUR } 4,996.20 \text{ to be paid by the bank}$$

## Short-term bonds and notes

### STB 1

The yield to maturity of the CD is higher than the coupon rate. This is why the price of the CD is higher than the face value.

### STB 2

$$\text{USD } 100,000,000 \times (1 - 182/360 \times 0.0246) = \text{USD } 98,756,333$$

### STB 3

$$\text{USD } 10,000,000 \times (1 - 60/360 \times 0.06) = \text{USD } 9,900,000.00$$

### STB 4

The price of a zero-coupon bond is more or less the nominal minus the interest on the bond. If the interest is positive, then this means that the price is lower than the nominal value of the bond.

### STB 5

$$\text{EUR } 10,000,000 / (1 + 90/360 \times 0.032) = \text{EUR } 9,920,634.92$$

### STB 6

$$\text{USD } 5,000,000 \times (1 - 90/360 \times 0.04) = \text{USD } 4,950,495.05$$

### STB 7

$$\text{GBP } 10,000,000 / (1 + 90/365 \times 0.035) = \text{GBP } 9,914,437.05$$

### STB 8

On the sale of a CD, the seller usually receives a price higher than originally paid. This is because of the accrued interest. However, this positive income will be set-off by a market loss if the current market yield is higher than the coupon rate of the CD. The net effect can be a loss.

### STB 9

Commercial paper is traded at the present value of the face value. If the currency yield (which is used as discount rate) is positive, then the present value is always lower than the face value.