

1

Currencies for which actual/365 is used are GBP, NZD, AUD, SGD, CAD, HKD, ZAR

2

Tokyo Overnight Average Rate

3

The convention for terms longer than four weeks in the money market is modified following.

4

The End of Month (EOM) convention should be used here.

5

In this case the End of Month convention should be used.

6

The convention for short-dates is Following.

7

0.045 bond basis is equivalent to $0.045 \times 360/365 = 0.0444$ money market basis. And 0.0444 semi-annual is equivalent to $((1 + 0.0444 - 1)^{0.5} - 1) \times 2 = 0.0449$

8

$360/365 \times 0.0308 = 0.0304$

9

$(1 + 0.0508/2)^2 - 1 = 0.0514$

10

0.0445 actual/360 is equivalent with $365/360 \times 0.0445 = 0.0451$ bond basis. And 0.0451 annual - $(1.0451^2 - 1) \times 2 = 0.0446$ semi-annual

11

2.87% bond basis is equivalent with $360/365 \times 2.87\% = 2.83\%$ actual/360. And 2.85% annual is $(1.0285^{0.5} - 1) \times 2 = 2.81\%$ semi-annual

12

$3.60\% + 0.15\% \times 10/30 = 3.65\%$

13

$$3.10\% + 20/90 \times (3.55\% - 3.10\%) = 3.20\%$$

14

$$\text{Yield} = 0.0254 / (1 - 61/360 \times 0.0254) = 0.0255$$

15

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

16

$$\text{Holding period return} = 31,250 / 10,000,000 \times 360 / 45 = 0.025$$

17

The interest for financial instruments with a term over 1 year is always paid annually.

18

$$((1 + 31/360 \times 0.0456) \times (1 + 60/360 \times 0.0471) - 1) \times 360/91 = 0.0467$$

19

$$(1 + 62/365 \times 0.0265) \times (1 + 78/365 \times 0.0287) \times (1 + 93/365 \times 0.0304) - 1) \times 365 / (62 + 78 + 93) = 0.0290$$

20

The curve stays normal but becomes less steep.

21

Market Segmentation Theory is a modern theory stating that there is no necessary relationship between long and short-term interest rates & that investors have fixed maturity preferences. It is also called segmented markets theory. Supporters of Market Segmentation Theory maintain that short-term and long-term rates are distinct markets, each with its own buyers and sellers, and are not easily substituted for each other.

22

$$r_b = 4,20\% + 20/30 \times 0.30 = 4,40\%$$

23

$$50\text{M} \times (1 + 31/360 \times 0.0367) = 50,158,013.90$$

24

$$100,000 / 15,500,000 \times 360/91 = 0.0255$$

25

Equivalent annual yield: $(1 + 0.0275/2)^2 - 1 = 0.0277$ and bond basis: $0.0277 \times 365/360 = 0.0281$

26

$((1 + 31/360 \times 0.0178) \times (1 + 60/360 \times 0.0198) - 1) \times 360 / 91 = 0.0191$

27

12th June is Saturday. According to the modified following convention: Monday 14 June

28

According to the end of month (EOM) convention, the 3 month value date is Tuesday 31th May.

29

Spot is 30th April. Regular 6 months date would be Saturday 30th October. According to the modified following convention: Friday 29 October because Monday would be 1 November and the value date should not exceed a month ultimo.

30

$2.20\% + 20/30 \times 0.30\% = 2.40\%$

31

$r_b = 4.20\% + 20/30 \times 0.30 = 4.40\%$

32

$200,000/31,000,000 \times 360/91 = 0.0255$

33

$29,275 / 50,000,000 \times 360/91 = 0.0232$

34

$(1 + 0.042 / 2)^2 - 1 = 0.0424$

35

$((1.0287)^{0.5} - 1) \times 2 = 0.0285$. Next, convert from actual/ 360 to bond basis: $0.0285\% \times 365/360 = 0.0289$.

36

$0.025 / (1 - 180/360 \times 0.025) = 0.0253$

37

The equation to be used is
$$\text{Yield} = \frac{\text{PDR}}{1 - \# \text{ days}/360 \times \text{PDR}}$$

$$\text{Yield} = \frac{0.035}{1 - 316/360 \times 0.035} = 0.0361$$

38

$$\text{Present value} = \frac{\text{NOK } 20,000,000}{1 + 60/360 \times 0.035} = \text{NOK } 19,884,009.94$$

39

$$\text{Price (present value)} = \frac{\text{SEK } 20 \text{ mio}}{1 + 0,017 \times 120/360} = \text{SEK } 19,887,305.27$$

40

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

41

$$\text{Discounted amount} = \text{USD } 10,000,000 \times (1 - 90/360 \times 0.025) = \text{USD } 9,937,500$$

42

$$((1 + 180/360 \times 0.0575)/(1 + 90/360 \times 0.055625) - 1) \times 360/(180-90)$$

43

$$((1 + 91/360 \times 0.0205)/(1 + 31/360 \times 0.0175) - 1) \times 360/(91-31)$$

44

$$r_{fw} = \left(\frac{1 + 0,0273 \times 180/360}{1 + 0,0257 \times 90/360} - 1 \right) \times 360/90 = \left(\frac{1,01365}{1,006425} - 1 \right) \times 4 = 0,0287$$

45

The general to calculate a forward rate in the money market is:

$$r_{fw} = \left(\frac{1 + r_1 \times d_1/360}{1 + r_s \times d_s/360} - 1 \right) \times 360/(d_1 - d_s)$$

Here

$$r_{fw} = \left(\frac{1 + 0.016 \times 273/360}{1 + 0.015 \times 182/360} - 1 \right) \times 360/91 = 0.0179$$

46

The equation to calculate a forward rate in the money market is:

$$r_{fw} = \left(\frac{1 + r_1 \times d_1/365}{1 + r_s \times d_s/365} - 1 \right) \times 360/(d_1 - d_s)$$

Here

$$r_{fw} = \left(\frac{1 + 0.0080 \times 154/365}{1 + 0.0070 \times 62/365} - 1 \right) \times 360/92 = 0.0087$$

47

$$\left((1 + 31/360 \times 0.0234) \times (1 + 60/360 \times 0.0255) \times (1 + 92/360 \times 0.0262) - 1 \right) \times 360/183$$

1

$$50,000,000 \times (1 + 4/365 \times 0.0456) = 50,024,986$$

2

Your position is 15 million long at a break-even rate of $(10 \times 0.67 + 5 \times 0.72) / 15 = 0.6867\%$. You take the bid rate of the broker: 0.69%, however you also have to pay the broker fee of 0.01%, i.e. effectively you only receive 0.68%. Your loss is $15,000,000 \times (0.0068 - 0.006867) \times 61/360 = 169$

3

Average rate of borrowing: $(10 \times 0.003125 + 5 \times 0.00375) / 15 = 0.0033$. To close your position you have to lend as a market user, i.e. you will be quoted 0.0036. Result = $15,000,000 \times 92/360 \times (0.0036 - 0.0033 - 0.0001) = 767$ profit.

4

Average rate of borrowing: $(10 \times 0.0375 + 5 \times 0.0390) / 15 = 0.0380$. To close your position you have to lend as a market user, i.e. you will be quoted 0.0388. Result = $15,000,000 \times 61/365 \times (0.0388 - 0.0380 - 0.0002) = 1,504$ profit

5

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

6

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

7

$$40,000,000 / (1 + 62/360 \times 0.032) = 39,780,764$$

8

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

9

Book value: $40,000,000 \times (1 + 30/360 \times 0.043) = 40,143,333$. Market value: $40,000,000 \times (1 + 90/360 \times 0.043) / (1 + 60/360 \times 0.043) = 40,142,313$. Trading result = $40,142,313 - 40,143,333 = -1,019$

10

$$50,000,000 \times (1 + 90/360 \times 0.034) / (1 + 30/360 \times 0.038) = 50,265,824$$

11

Market value = $20,000,000 \times (1 + 92/365 \times 0.0238) / (1 + 55/365 \times 0.0437) = 19,988,356$. Book value = $20,000,000 \times (1 + 37/365 \times 0.0238) = 20,048,252$. Trading result = market value - book value = $19,988,356 - 20,048,252 = -59,896$

12

Investment: $20,000,000 / (1 + 90/360 \times 0.037) = 19,816,696$. Sale proceeds: $20,000,000 / (1 + 30/360 \times 0.032) = 19,946,809$. Return as an amount: 130,113. Yield: $130,113 / 19,816,696 \times 360 / 60 = 3.94\%$

13

$51,500,000 \times (1 + 14/360 \times 0.0065) = 51,513,018$ (you are the buyer and act as market user therefore the rate is 0.65%)

14

Interest amount is $\text{EUR } 6,900,000 \times 14/360 \times 0.019 = 5,098$. rRepurchase price = $\text{EUR } 6,905,098$

15

You are the buyer and act as market maker, i.e. you quote 0.0354. $40,000,000 / 1.03 \times 10/360 \times 0.0345 = 37,216$

16

$51,500,000 / 1.01 \times (1 + 14/360 \times 0.0070) = 51,003,980$

17

$50,000,000 \times 31/360 \times 0.0367 = 50,158,013$

18

$15,000,000 \times 3/360 \times 0.0125 = 15,001,562$

19

$\text{GBP } 15,000,000 \times 31/365 \times 0.0325 = 15,041,404$

20

$\text{EUR } 11,700,000 \times 30/360 \times 0.0050 = \text{EUR } 4,875$

21

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

22

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

23

The maturity amount of this CD is $10,000,000 (1 + 90/360 \times 0.05) = \text{USD } 10,125,000$ (FV). The present value of this CD is $10,057,947.022$. $? = (10,125,000 / 10,057,947.02 / - 1) \times 360/30 = 0.08$

24

You reverse in repo means that you are the repo buyer. You are the market maker and lend money: the rate is 3.33%. Interest = $266.125.000 \times 14/360 \times 0.0333 = \text{EUR } 344,631.88$

25

Init. Cons. = $\text{EUR } 15,000,600 / 1.10 = \text{EUR } 13,636,909.09$

26

If the bond goes special, this means that the buyer very much wants to have the bond. Therefore he is willing to lend money at a lower rate than would be the case with GC. rate = $3.25\% - 0.50\% = 2.75\%$. $\text{GBP } 10,500,000 \times 7/365 \times 0.0275 = \text{GBP } 5,537.67$

27

He will choose the lowest interest rate. The lowest rate with daycount convention actual/360 is that of Saxo Bank. Converted to 30/360, this rate would be $4.16\% \times 365/360 = 4.22\%$. ABN AMRO's rate would be even higher: $4.18\% \times 365/360 = 4.24\%$. Therefore, the rate of Den Danske Bank is the most favourable

28

$\text{EUR } 25,000,000 \times (1 + 91/360 \times 0.0325) \times (1 + 90/360 \times 0.0355) \times (1 + 91/360 \times 0.0415) \times (1 + 89/360 \times 0.0419) = \text{EUR } 25,962,011.01$

29

After the first period, your investment has a value of $10,000,000 \times 91/360 \times 0.0314 = 10,079,372.22$. After the second period, your investment has a value of $10,079,372.22 \times 90/360 \times 0.0324 = 10,161,015.14$. After the third period, your investment has a value of $10,161,015.14 \times 89/360 \times 0.0306 = 10,237,883.21$. After the last period, your investment has a value of $10,237,883.21 \times 92/360 \times 0.0298 = 10,315,850.38$

30

$20,000,000 / (1 + 45/360 \times 0.0320) = 19,920,318$

31

$\text{USD } 50,000,000 \times (1 - 182/360 \times 0.0098) = \text{USD } 49,752,278$

32

Final proceeds = $10,000,000 \times (1 + 90/360 \times 0.04) = \text{EUR } 10,100,000.00$

33

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

34

The maturity amount of this CD is $10,000,000 (1 + 90/360 \times 0.03) =$
 USD 10,075,000 (FV). You buy the CD at 10,040,000. $? = (10,075,000 /$
 $10,040,000 / - 1) \times 360/30 = 0.0418$

35

Final proceeds of the CD = $100,000,000 \times (1 + 90/360 \times 0.005) = 100,125,000$.
 Present value of the value at maturity = $110,125,000 / (1 + 60/360 \times 0.0025) =$
 JPY 100,083,298.62

36

Book value = $100,000,000 \times (1 + 60/360 \times 0.035) = 100,583,333$. Selling price
 $100,000,00 \times (1 + 90/360 \times 0.035) / (1 + 30/360 \times 0.035) = 100,581,634$. Trading
 loss = $100,581,634 - 100,583,333 = 1,699$

37

Book value = $10,000,000 \times (1 + 30/360 \times 0.03) = 10,025,000$. Selling price
 $10,000,00 \times (1 + 60/360 \times 0.035) / (1 + 30/360 \times 0.03) = 10,024,875$. Trading
 loss = $10,024,875,10 - 10,025,000 = 124,90$

38

Purchase price = 1,500,000. Selling price = $1,500,000 \times (1 + 181/360 \times$
 $0,0275) / (1 + 31/360 \times 0,0260) = 1,517,342.42$. Result = 17.352,42. Yield=
 $17.352,42 / 1,500,000 \times 360 / 150 = 0,02775$

39

$(0.066875 - 0.06625 - 0.0002) \times 7/365 \times 25M = 203.77$

40

You pay a total interest amount of $20,000,000 \times 60/360 \times 0.0314 + 30,000,000$
 $\times 60/360 \times 0.0328 = 104,666.67 + 164,000 = 268,666.67$. You earn an interest
 amount of $50,000,000 \times 60/360 \times 0.0345 = 287,500$. You make a profit of
 $287,500 - 268,666.67 = 18,833.33$

41

You are the repo seller. You are the market maker and borrow money: you
 quote 3.33%. Interest = $266.125.000 \times 14/360 \times 0.0333 = \text{EUR } 344,631.88$

42

Mat. Cons. = $\text{USD } 20,300,000 \times (1 + 7/360 \times 0.0178) = \text{USD } 20,307,026.06$

43

Maturity consideration = $13,636,909 \times (1 + 7/360 \times 0.0158) = 13,641,098$

44

$$\text{Interest Amount} = (\text{GBP } 50,000,000 \times 1.02) \times \frac{5}{365} \times 0.02 = \text{GBP } 13,972.60$$

45

$$5,250,000 \times \frac{14}{365} \times (0.0310 - 0.0035) = \text{GBP } 5,537$$

46

$$20,360,000 (1 + \frac{4}{360} \times 0.0132) = 20,362,986$$

47

$$\text{Interest amount} = \text{USD } 51,250,000 \times \frac{5}{360} \times 0.0200 = \text{USD } 14,236.11$$

48

$$20,329,927.30 \times (1 + \frac{10}{360} \times 0.0125) = 20,336,986.30.$$

49

$$\text{USD } 25,000,000 \times (1 + \frac{61}{360} \times 0.0144) \times (1 + \frac{87}{360} \times 0.0167) \times (1 + \frac{93}{360} \times 0.0182) = \text{USD } 25,280,446$$

50

$$\text{GBP } 60,000,000 (1 + \frac{82}{365} \times 0.0244) \times (1 + \frac{87}{365} \times 0.0267) \times (1 + \frac{183}{365} \times 0.0282) = \text{GBP } 61,571,234$$

1

Your client has sold 5 million MXN against USD which means that he has bought USD. Banks only trade FX spot, therefore you should buy USD spot. In order to match the settlement dates you should sell and buy USD in an FX swap.

2

In the offsetting the client transaction first you sell EUR against GBP. As a market user you will be quoted the bid rate and since the amount in the base currency is known, the direct quotation is used. Next you sell GBP against CHF. Again as a market user you will be quoted the bid rate and since the amount in the base currency is known, the direct quotation is used.

3

The left-hand side points are higher than the right-hand side points. This means that the EUR is trading at a discount and that the EUR interest rates are higher than the CHF interest rates. If EUR rates go up, then the interest differential will increase and therefore also the number of swap points.

4

If GBP/USD swap points are quoted 16 - 14 this means that the GBP is trading at a discount and that the FX rate is lower if the settlement takes place on a later moment. In order to profit from a discount, you should sell first (at the higher rate) and buy later (at a lower rate).

5

You have bought and sold EUR against HKD in a 3 month FX swap. In terms of deposits you are overborrowed EUR and overlent HKD. An increase in EUR rates and/or a decrease in HKD rates are favorable developments.

6

You are short EUR/CHF with settlement tomorrow. This is why you have to buy EUR tomorrow and sell EUR spot. The second leg replicates the original settlement obligation.

7

The spot settlements will offset each other. And only the settlements on behalf of the far legs will be effective, i.e. buy EUR after 3 months and sell EUR after 6 months.

8

You are overlent in 6 months USD deposits and want to hedge by borrowing EUR and selling and buying EUR in an arbitrage swap. In the FX swap you will be quoted the right-hand side. If you sell and buy, the points are in your favour in case of a discount (sell high, buy low). And you pick the quote with the highest discount.

9

You have sold and bought USD, which means that you must have borrowed USD. In the swap you converted this USD funding into CHF funding.

10

Your client has sold USD outright forward. Banks only trade FX spot, therefore you should sell USD spot. In order to match the settlement dates you should buy and sell USD in an FX swap.

11

The left-hand side points are higher than the right-hand side points. This means that the EUR is trading at a discount and that the EUR interest rates are higher than the GBP interest rates. If GBP rates go down, then the interest differential will increase and therefore also the number of swap points.

12

In offsetting this client transaction first you sell GBP against EUR (i.e. buy EUR). As a market user you will be quoted the ask rate and since the amount in the quoted currency is known, the indirect quotation is used. Next you sell EUR against NOK. Again as a market user you will be quoted the bid rate and since the amount in the base currency is known, the direct quotation is used.

13

You have sold and bought euro in a EUR/USD swap which means that you are overlent EUR and overborrowed USD.

14

If EUR/USD swap points are quoted 21-19 this means that the EUR is trading at a discount and that the FX rate is lower if the settlement takes place on a later moment. If the points are against you this means that you first have bought (at the higher rate) and later sell (at a lower rate). Buy high - sell low.

15

You are short EUR/SEK with settlement tomorrow. This is why you have to buy EUR tomorrow and sell EUR spot. The second leg replicates the original settlement obligation.

16

You are overborrowed in USD. One way to close this position is to sell and buy the USD in a EUR/USD swap. But now you are overborrowed EUR which means that you have to lend EUR.

17

You want to buy the GBP so you have to bid higher than the market, i.e. 0.9051. At the same time you do not want to take the chance that your position will increase. This is why your ask price should be higher than the market.

18

You want to sell GBP and buy euro, so you must quote a high bid rate. You don't want to quote either way because then you run the risk that the counterparty is going to buy euro from you, which would increase your long GBP position

19

$$\frac{\text{EUR}/\text{NOK}_{\text{ask}}}{\text{EUR}/\text{GBP}_{\text{bid}}} = \text{GBP}/\text{NOK}_{\text{ask}}$$

20

$$\text{EUR}/\text{USD}_{\text{ask}} \times \text{USD}/\text{CAD}_{\text{ask}} = \text{EUR}/\text{CAD}_{\text{ask}}$$

21

In offsetting this client transaction first you buy GBP against EUR (i.e. sell-EUR). As a market user you will be quoted the bid rate and since the amount in the quoted currency is known, the indirect quotation is used. Next you buy-EUR against SEK. Again as a market user you will be quoted the ask rate and since the amount in the base currency is known, the direct quotation is used.

22

In offsetting this client transaction first you buy EUR against USD. As a market user you will be quoted the ask rate and since the amount in the base currency is known, the direct quotation is used. Next you buy USD against ARS. Again as a market user you will be quoted the ask rate and since the amount in the base currency is known, the direct quotation is used.

23

If EUR/USD swap points are quoted 15/19 this means that the EUR is trading at a premium and that the FX rate is higher if the settlement takes place on a later moment. If the points are in your favour this means that you first have bought (at the lower rate) and later sell (at a high rate). Buy low-sell high.

24

The swap points are the expression of the interest rate differential between euro and US dollar. Because the euro is trading at a premium, the euro interest rates are lower than the US dollar interest rates. If the euro interest rates stay the same and the US dollar interest rate will decrease, the interest rate differential will decrease and, as a result, the bid and the ask price of an FX swap will decrease.

25

The swap points are the expression of the interest rate differential between the euro and the Swiss franc. Because the euro is trading at a discount, the euro interest rates are higher than the CHF interest rates. If the euro interest rates stay the same and the CHF interest rates decrease, the interest rate differential increases and, as a result, both the bid and the ask price of an FX swap will increase.

26

You have borrowed GBP and have lent US-dollars. Therefore, the most favourable movement is an decrease in US-dollar interest rates and a increase in GBP interest rates.

27

You have lent euro and have borrowed US-dollars. Therefore, the most favourable movement is an increase in US-dollar interest rates and a decrease in euro interest rates.

28

Only the swap points are stated as a price. This means that the transaction was an FX wap. As a market user the client gets the most unfavourable rate which here is - 54. This means that he has bought in the far leg. Therefore, you as market maker have bought and sold.

29

You must sell EUR per spot or forward. If you sell them spot, you need to square your liquidity position by either buying and selling the euro or borrowing euro and investing in USD.

30

You receive the US dollars from your taken US-dollar deposit. This means you should sell and buy the US-dollars. This means that you trade on the ask side of the FX swap quotation. The points are in your favour, therefore - 147 is the most favourable quote for you.

Alternative explanation:

In the swap you 'lend' the US dollars and 'borrow' the Swissies. Since the US-dollar interest rate is higher than the CHF interest rate, you receive the interest rate differential (expressed in swap points). This is why the points are in your favour. And of course you want as many points in your favour as you can get, i.e. 147 instead of 145.

31

If an FX spot dealer is short euro, this means that he has to transfer the euro amount on the spot date. The dealer, however, waits until the next day to roll over his position for one more day. He then buys the euro value tomorrow and sells them back on the spot date.

32

Banks only trade FX spot, therefore you should buy GBP spot. In order to match the settlement dates you should sell the GBP spot and buy GBP tomorrow in an FX swap: i.e. buy and sell

33

To close his overlent USD position, in the swap he 'borrows' USD, i.e. buy and sell USD, i.e. sell and buy EUR. Now he is overlent EUR therefore he has to borrow EUR.

34

To close his overborrowed CHF position, in the swap he 'lends' CHF, i.e. sell and buy CHF, i.e. buy and sell EUR. Now he is overborrowed EUR therefore he has to lend EUR.

35

Borrow in another currency and sell and buy this currency in an FX swap against the currency that you wanted to borrow in the first place.

36

You have to pay USD/ receive euro after four months and now need them after two months. To offset the original trade, you buy and sell euro for four months next, you sell and buy euro in two months

37

You need to be overborrowed in euro and overlent in US dollars after three months. Therefore you have to buy and sell euro in six months and buy and sell them at three months. As a result, you can sell and buy euro for three months again. This means lending euro and borrowing US dollars

38

The spot legs will offset each other; then remain the forward leg of the 3 months FX swap, i.e. buy euro and the forward leg of the 6 month swap, i.e. sell euro.

39

You are long EUR/SEK with settlement tomorrow. This is why you have to sell EUR tomorrow and buy EUR spot. The second leg replicates the original settlement obligation.

1

You buy USD and GBP at your ask rate $3,000,000 / 1.6055 = 1,868,576$

2

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

3

$10,000,000 / 0.7040 = \text{AUD } 14,204,545$

4

The revaluation rate is lower than your average rate. therefore your position is at a loss: $5,000,000 \times (6.8150 - 6.8235) = \text{DKK } -42,500$

5

Position: $2 - 3 + 4 - 5 = \text{GBP } 2\text{m short}$. Average rate: $(2 \times 1.4235 - 3 \times 1.4265 + 4 \times 1.4270 - 5 \times 1.4265) = 1.4285$

6

Your client wants to sell EUR per spot. EUR trades at a premium. therefore the rate for value tomorrow is lower than the spot rate. This means that the swap points have to be subtracted from the spot rate. You quote your bid rate, i.e. the lowest possible rate. Therefore you subtract 0.0003.

7

$\text{CAD/SEK bid} = \text{GBP/SEK bid} / \text{GBP/CAD ask} = (12.2560 - 0.0300) / (2.0460 + 0.0034) = 12.2260 / 2.0494 = 5.9656$

8

$1.0525 \times (1 + 62/360 \times 0.0030) / (1 + 62/360 \times 0.033) - 1.0525 = -0.0054$

9

$\text{GBP/CHF ask} = \text{GBP/USD ask} \times \text{USD/CHF ask} = 1.0132 \times 1.4265 = 1.4453$

10

$\text{CHF/CAD ask} = \text{USD/CAD ask} / \text{USD/CHF bid} = (1.4265 + 0.0012) / (1.0130 - 0.0015) = 1.4277/1.0115 = 1.4115$

11

You sell CHF, which means that you buy JPY. You can buy JPY at the market maker's ask side for 1 month: $0.009240 + 0.000018 = 0.009258$

12

EUR trades at a premium, therefore the t/n points should be subtracted. For an ask rate as less as possible: -0.000022 .

13

Bid: $1.4430 - 0.0020 = 1.4410$. Ask: $1.4434 - 0.0016 = 1.4418$

14

Forward rate is $12.1928 \times (1 + 30/360 \times 0.0375) / (1 + 30/365 \times 0.0075) = 11.2234$. FW ask rate is $12.1928 + 0.0306 = 12.2234$

15

Spot ask rate: 9.7455. EUR is trading at a premium, therefore the points have to be subtracted: $9.7455 - 0.00045 = 9.74505$

16

The swap trader is selling and buying in three months: he will be quoted the right-hand side: +22. He is buying and selling in six months: he will be quoted the left-hand side: 38. The difference is 16.

17

EUR/INR is trading at a premium. Bid side: spot bid rate minus one month swap points: $73.32 + 0.04 = 73.36$. Ask side: spot ask rate plus three months swap points: $73.42 + 0.10 = 73.52$

18

You have bought $100,000,000 / 79.70 \text{ USD} = \text{USD } 1,254,705$ against 100 m RUB. You can sell $100,000,000 / 77.80 \text{ USD} = \text{USD } 1,285,347$ against 100m RUB. You realize a loss of $1,254,705 - 1,285,347 = \text{USD } 30,642$.

19

XAU/USD ask \times USD/SGD ask = $1,097.60 \times 1.4575$

20

Buy JOD means selling USD. As a market user he will be quoted the bid rate. The amount in the base currency is known, therefore you use the indirect quotation: $5,000,000 / 0.7050 = \text{USD } 7,092,198$

21

Buying Japanese yen means selling CHF. You will be quoted the bid rate. The amount in the quoted currency is known therefore you use the indirect quotation: $120,000,000 / 110.50 = 1,085,973$

22

EUR/GBP ask = $(0.8530 + 0.0018) \times (1.4460 - 0.0008) = 1.2354$

23

EUR/CAD bid = $1.4250 \times 1.0820 = 1.5419$

24

You have sold at 1.5250 and you now can buy at 1.5237.
 $10,000,000 \times 0.0013 = + \text{CAD } 13,000$

25

$$\frac{\text{EUR}/\text{USD}_{\text{bid}}}{\text{AUD}/\text{USD}_{\text{ask}}} = \frac{1,3500}{0,9060} = 1.4901$$

26

$$1.1005 \times (1 + 180/360 \times 0.0125) / (1 + 180/360 \times 0.0345) - 1.1005 = -0.0119$$

27

You must use the spot ask rate and the tom/next left hand side rate. Since it is a reverse quotation, the euro trades at a discount. This means that the FX rate value tomorrow is higher than the FX spot rate. You add the ask price of the tom/next quotation = + 1.25 points to the spot rate: $1.2432 + 0.000125 = 1.243325$

28

$$5,000 \times 1,700.25 = 8,501.250$$

29

You quote $1/1.3715 - 1/1.3710$

30

You want to buy US-dollars and sell Sterling. This means you get the bid price GBP/USD. The Sterling amount needed is $5,000,000 / 1.65 = \text{GBP } 3,030,303.03$

31

You buy Japanese Yen, therefore you sell CHF. As a market user you will get the market maker's bid price: 110.50 . $120,000,000 / 110.50 = 1,085,972.85$

32

You have bought at 1.5255 and you now can buy at 1.5272.
 $10,000,000 \times 0.0017 = \text{CAD } 17,000$

33

To close your position you must buy euro in the market as a market user at the higher rate of 1.9262, therefore you suffer a loss. The result is $(1.9250 - 1.9262) \times 5,000,000 = \text{minus SGD } 6,000$

34

$$10,000,000 \times (0.6712 - 0.6729) = - \text{GBP } 17,000$$

35

To close your position you must sell USD in the market as a market user at 8.53 The result is $(8.53 - 8.42) \times 10,000,000 = \text{HKD } 1,100,000$ profit

36

If you should close your position, you should sell your euro. Therefore you would get the bid price of 1.3640. You would suffer a loss of $10,000,000 \times 0.0010 = \text{USD } 10,000$.

37

$((5 \times 1.3456 - 8 \times 1.3612 - 3 \times 1.3584) / (5 - 8 - 3) - 1.3602) \times 6,000,000$

38

	EUR	USD
transaction 1	+ 4,000,000	- 5,781,200
transaction 2	- 5,000,000	7,237,000
transaction 3	+ 3,000,000	- 4,296,300
	+2,000,000	2,840,500

Average rate = $2,840,500 / 2,000,000 = 1.4203$

39

	EUR	USD
transaction 1	- 4,000,000	5,021,200
transaction 2	- 5,000,000	6,337,000
transaction 3	+ 2,000,000	- 2,464,200
	-7,000,000	8,894,000

The average rate of the position is $8,894,000 / 7,000,000 = 1.2706$. The valuation rate is 1.2500, this means a profit of $7,000,000 \times (1.2706 - 1.2500) = 142,200$.

40

Transaction 3: sell 3 million euro, Transaction 4: buy 7 million euro. Position = $+ 4 - 5 - 3 + 7 = 3$ million euro long. Average rate = $(4 \times 1.3245 - 5 \times 1.3308 - 3 \times 1.3275 + 7 \times 1.3323) / 3 = 1.3292$

41

You should divide the EUR/NOK rate by the EUR/USD rate. The bid rate can be calculated by dividing the bid rate EUR/NOK by the ask rate USD/NOK. $8.30 / 1.5060 = 5.5113$

42

$1.3505 / 0.09050 = 1.4923$

43

$$\frac{\text{EUR}/\text{CHF}_{\text{ask}}}{\text{EUR}/\text{USD}_{\text{bid}}} = \text{USD}/\text{CHF}_{\text{ask}}$$

$$1.3520 / 1.5050 = 0.8983$$

44

The forward points are the difference between the FX forward rate and the FX spot rate: $(2.3660 - 2.3875) - (2.2670 - 2.2880) = 215 - 210$

45

$$307.50 \times (1 + 180/360 \times 0.065) / (1 + 180/360 \times 0.0045) - 307.50 = 928$$

46

$$\text{Forward FX rate} = \frac{0,9500 \times (1 + 90/360 \times 0,03)}{1 + 90/360 \times 0,04} = \frac{0,9571}{1,01} = 0,9476$$

47

$$8.05 + 0.03 = 8.08$$

48

The one month bid price can be calculated by adding the left hand side of the swap quotation to the spot bid rate. Since the swap quotation is reverse, the EUR trades at a discount: $- 0.06$. $9.75 - 0.06 = 9.69$

49

$$\text{FXFW} = \frac{80.50 \times (1 + 90/360 \times 0.0025)}{1 + 90/360 \times 0.01} = 80.35$$

50

$$\text{Forward FX rate} = \frac{1.4650 \times (1 + 90/360 \times 0.0075)}{1 + 90/360 \times 0.01} = 1.4641$$

51

You want to sell CHF, which means that you must buy GBP. 'You are quoted' means that you are a market user. Therefore, you will get the ask price of the spot rate and the right hand side of the swap points. GBP trades at a discount and therefore the swap points should be subtracted from the spot rate. Therefore: $1.8457 - 0.0218 = 1.8239$

52

The one month ask price can be calculated by adding the right hand side of the swap quotation to the spot ask rate. Since the quotation is reverse, the EUR trades on a discount: $- 0.12$. Therefore: $8.80 - 0.12 = 8.68$

53

$$\text{EUR}/\text{USD}_{\text{bid}} \times \text{USD}/\text{CAD}_{\text{bid}} = (1.3050 - 0.0013) \times (0.9550 + 0.0010) = 1,2463$$

54

The 1 month forward ask price USD/NOK can be calculated by dividing the EUR/NOK 1 month forward ask price by the EUR/USD 1 month forward bid price. The EUR/NOK 1 month forward ask price is $8.0200 - 0.0080 = 8.0120$. The EUR/USD 1 month forward bid price is $1.3050 + 0.0012 = 1.3062$. Therefore, $\text{EUR/NOK}_{\text{ask}} / \text{EUR/USD}_{\text{bid}}$ 1 month forward is $8.012 / 1.3062 = 6.1338$

55

The 1 month forward ask price CHF/SEK can be calculated by dividing the EUR/SEK 1 month forward ask price by the EUR/CHF 1 month forward bid price

$$\frac{\text{EUR/SEK}_{\text{ask}}}{\text{EUR/CHF}_{\text{bid}}} = \text{CHF/SEK}_{\text{ask}}$$

The EUR/SEK 1 month forward ask price is $10.0675 - 0.0080 = 10.0595$. The EUR/CHF 1 month forward bid price is $1.3050 - 0.0010 = 1.3040$. Therefore, CHF/SEK 1 month forward ask price is $10.0595 / 1.3040 = 7.7143$

56

GBP trades at a discount, therefore the points should be added with ex ante dates. Because of the fact that an ask rate should be calculated, the highest number of points should be added.

	bid
spot GBP/USD	0.8700
tom/next	1.3
overnight	1.1
	0.87024

57

The bid price value 13 April is the bid price of the FX spot rate adjusted with the tom/next points. The GBP is trading at a discount, therefore the tom/next points should be added to the FX spot rate. The right hand side of the tom/next quotation is 0.00013. The FX rate value tomorrow is $1.1500 + 0.00013 = 1.15013$

58

You must use the spot ask rate and the tom/next left hand side rate. Since it is a reverse quotation, the euro trades at a discount. This means that the FX rate value tomorrow is higher than the FX spot rate. You add the ask price of the tom/next quotation = + 1.25 points to the spot rate: $1.2432 + 0.000125 = 1.243325$

59

You must use the spot ask rate and the tom/next left side rate. Since it is a normal quotation, the euro trades at a premium. This means that the FX rate value tomorrow is lower than the FX spot rate. You take the ask price of the tom/next quotation = - 0.50 points. Therefore: $1.3432 - 0.000050 = 1.34315$

60

You are long EUR, therefore you have to sell and buy euro in the tom/next swap. As a buyer in the forward leg, you will hit the market's right hand side: +2. Since the euro is trading at a premium, the points are against you. You have to make good the tom/next points when closing your position by selling the euro. Your new break-even rate, therefore, is $0.8850 + 0.0002 = 0.8852$

61

You are short USD, therefore you have to buy and sell euro in the tom/next swap. As a seller in the forward leg, you will hit the market's left hand side: -5. Since the USD is trading at a discount, the points are against you. You have to make good the tom/next points when closing your position by buying the US dollars. Your new break-even rate, therefore, is $112.34 - 0.05 = 112.29$

62

GBP is trading at a discount against the US dollar and you buy and sell the GBP. This means that the swap points are against you. You lose 2 points in the t/n swap. Your average (selling) rate, therefore, decreases to 1.6541.

63

In the t/n swap you have to sell and buy euro, hence you are quoted 0.0001 (against you). Break-even rate = $1.1537 + 0.0001 = 1.1538$

64

In the t/n swap you have to buy and sell JPY, hence you are quoted = 0.0001 (your favour). Break-even rate is $0.0584 + 0.0001 = 0.0585$

65

The trader has bought at 22 and sold at 38

66

The euro trades at a premium and the client sells at a later date (+50) than he buys (at +30). The points are in his favour.

67

The euro trades at a discount and as a client you sell at an earlier date (- 50) than you buy (-60).

68

Your client has to buy 500,000 at the contract rate 0.9349. He has to sell them at your bid price 0.9330

69

Your client has to sell EUR 500,000 at the contract rate 1.1014. He has to buy them at your ask price of 1.1014. He has a profit of $500,000 \times (1.1140 - 1.1014) = \text{CHF } 6,300$.

70

NDF are always settled in the convertible currency. Here, this is USD. 'Sold' 100,000,000 TWD in the NDF contract: $100,000,000 / 32.50$ USD. 'Bought' 100,000,000 TWD to fix the contract: $100,000,000 / 33.45$ USD. The settlement amount is $\text{USD } 2,989,536.61 - \text{USD } 3,076,923.08 = - \text{USD } 87,386.45$

71

NDF are always settled in the convertible currency. Here, this is USD. The settlement amount is $50,000,000 / 32.50 - 50,000,000 / 35 = 67,873.30$ USD. The USD obviously has increased in value and the Taiwanese dollar has, in turn, lost value. Therefore, as the buyer of the TWD you must pay.

72

$100 \times 1246.25 \times 7.7552 = 966,492$

73

The swap points are the difference between the FX forward rate and the FX spot rate: $(2.0192 - 2.0250) - (2.0188 - 2.0254) = 68 - 66$

74

Indirect quotation: $1/1.3715 - 1/1.3710 = 0.7291 - 0.7294$

1

$$((1 + 213/365 \times 0.0087) / (1 + 31/365 \times 0.0052) - 1) \times 365 / (213 - 31) = 0.0093$$

2

A forward lender must borrow in the future in order to close his position. Therefore his risk is an increase in interest rates.

3

You should hedge the 2s v 5s forward period and want to hedge against decreases in interest rates. Therefore, you should sell an FRA at 4.22%.

4

You should hedge the 2s v 5s forward period and want to hedge against increases in interest rates. Therefore, you should buy an FRA at 0.81%.

5

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

6

You are long and the price went down, therefore your position is at a loss.
30 contracts x 3 pips x 25 (value of 1 point) = CHF 2,250

7

If you sell an FRA you profit from decreasing interest rates. This is also the case if you open an overlent position because this means that you have to borrow in the future in order to close your position.

8

Futures margin calls are calculated as the daily result.
 $8 \times 1,000,000 \times 90/360 \times (0.9926 - 0.9922) = 800$.

9

1st net payment: USD 10,000,000 x (0.0412/2 - 0.04/2) = + USD 6,000
2nd net payment: USD 10,000,000 x (0.0408/2 - 0.04/2) = + USD 4,000
3rd net payment: USD 10,000,000 x (0.0402/2 - 0.04/2) = + USD 1,000
4th net payment: USD 10,000,000 x (0.0395/2 - 0.04/2) = - USD 2,500

10

$$((1 + 91/360 \times 0.029) / (1 + 31/360 \times 0.0278) - 1) \times 360/60 = 0.0299$$

11

As a market user you will be quoted the ask rate and you choose the lowest possible ask rate.

12

PV of 40,000,000 x (0.0365 - 0.0375) x 90/360 = 10,000,000, therefore
 10,000,000 / (1 + 90/360 x 0.0365) = 9,909.58.

13

$((1 + 180/360 \times 0.00350) / (1 + 90/360 \times 0.0368) - 1) \times 360/90 = 0.0329$

14

The buyer of a swap pays the fixed rate, here 4.75% and the floating coupon payment is 5.75%, therefore the buyer receives on balance 1%. The amount to be received by the buyer = 100,000,000 x 1% x 1/2 = EUR 500,000 to be paid by the seller

15

You have a loan which will be reprised in 1 month for a period of 3 months (= underlying period), therefore you are exposed to rising interest rates, therefore you have to buy an FRA. As a market user you buy at the ask rate

16

As a market user you will be quoted a bid price from the market maker and ING's bid price is the highest.

17

FRA settlement amount = $\frac{10,000,000 \times 91/360 \times (0.047 - 0.045)}{1 + 91/360 \times 0.047} = 4,996,20$

18

PV of 5,000,000 x (0.044 - 0.0375) x 183/360 = 16,520,83
 16,520.83 / (1 + 183/360 x 0.044) = 16,159.40

19

The margin call is 10 x 500,000 x 0.0030 x 1/4 = GBP 3,750. Since the futures price has increased and the dealer has a long position, he will receive this amount.

20

The closing of the short position leaves the dealer with a loss of
 20 x 1,000,000 x 0.0012 x 1/4 = 6,000

21

The market value of the FRA and of the money market futures will develop more or less in the opposite direction. At the moment the money market futures are closed, the implied forward rate apparently was 100 - 96.92 = 3.18. The market value of the FRA then was 25,000,000 x (3.18 - 2.87) x 90/360 = EUR 19,375,000. This profit is locked in by closing the position

22

After six months: pay $10,000,000 \times (0.025 - 0.0245) \times 1/2 = 2,500$. After twelve months: receive $10,000,000 \times (0.0275 - 0.025) \times 1/2 = 12,500$. After eighteen months: receive $10,000,000 \times (0.0285 - 0.025) \times 1/2 = 17,500$. After two years: receive $10,000,000 \times (0.0290 - 0.025) \times 1/2 = 20,000$

23

Over-borrowed means that he has to protect against decreasing rates. He can either sell an FRA at 1.36% which protect him under 1.36% or buy the future at 98.63 which protect him under 1.37%.

24

The amount to be settled is $0.0005 \times 5/360 \times 100,000,000 = \text{EUR } 694$. The fixed rate is higher than the floating rate; therefore the buyer must pay

1

The premium of an option is never a function of the traded volume. The historical volatility is not a parameter for the option premium, this is the implied volatility. If the price of the underlying goes up, then the premium for an option goes down. This is a negative function. The right answer, therefore, is the implied volatility. For all options (both for calls and puts) it is true that the premium goes up if the implied volatility goes up.

2

A long call gives you the chance to get a long position in the underlying. To delta hedge you should, therefore, sell the underlying. Since the option is OTM this means that the chance that the option will be exercised is less than 50%. You should therefore sell less than 50% of the underlying.

3

A straddle is a so-called volatility strategy which means that the market party takes a position in the volatility of the underlying and does not want to take profit from the direction of the price changes of the underlying.

4

The premium is USD 0.0200 for each euro contract amount. The total premium, therefore, is $3,000,000 \times 0.0200 = \text{USD } 60,000$

5

The option position gives you the obligation to buy 5 million EUR with a probability of 30%. Therefore your position reacts to changes in the EUR/USD rate as a long EUR/USD position of 1,500,000. To hedge this sensitivity you should sell EUR 1500,000.

6

The option position gives you the obligation to buy 100 million GBP with a probability of 30%. Therefore your position reacts to changes in the GBP/USD rate as a long GBP/USD position of 30M. To hedge this sensitivity you should sell GBP 30,000,000.

7

The option position gives you the right to sell the underlying value with a probability of almost 100%. This means that you have a short position of almost the whole option contract. To hedge you should buy between 50% and 100%.

8

The rate is quoted as EUR/GBP. The premium is, therefore, $4,000,000 \times 0.0300 = \text{GBP } 120,000$.

9

The option position gives you the obligation to buy 100 million EUR with a probability of 40%. Therefore your position reacts to changes in the EUR/USD rate as a long EUR/USD position of 40M. To hedge this sensitivity you should sell EUR 40,000,000.

10

The option position gives you the obligation to sell 100 million EUR with a probability of 50%. Therefore your position reacts to changes in the EUR/USD rate as a short EUR/USD position of 50M. To hedge this sensitivity you should buy EUR 50,000,000.

1

In gap reports, FRAs are reported as two opposite loans. (This is also the case for IRSs and STIR futures). A bought 6s v 9s FRA gives the same position as a taken 9 months deposit and a given 6 months deposit. This position would give a profit if interest rates go up. A 6 years payers IRS with a 3-month EURIBOR as reference rate would, for instance, be reported as a 3 month deposit on the asset side and a six year loan on the liability side of a gap report.

2

Interest immunization means making sure that the bank incurs no interest risk. This is the case if the maturities of the assets match the maturities of the liabilities. Since usually the assets of a bank have a longer maturity than the liabilities, in order to immunize the bank should decrease the maturities of the assets and/or increase the maturities of the liabilities.

3

In a gap report the items are slotted according to their remaining interest term. In this case this is 3 months.

4

The term for which the interest rates for portfolios of savings deposits are fixed is assumed to be at least a number of years. This is also true for savings deposits that are immediately withdrawable. This, in turn, means, that the modified duration of savings deposits is many times greater than 3 months. The duration can be between 3 and 9.

5

The bank may have, for instance, a six year consumer loan in the 6 year asset bucket. The combination of this six year loan and an IRS in which the bank pays the fixed rate, converts the six year loan into a synthetic floating rate loan.

6

If the creditworthiness of the reference entity increases, then the value of the CDS increases too. Your exposure to the seller increases and, therefore, you counter party credit risk increases.

7

If interest rates rise, then the value of the 10 years IRS will go up and the value of the 5 years IRS will go down. The 10 years swap is the most interest sensitive, however, and the value of this IRS will, therefore, increase more than that the value of the 5 years swap will decrease. The net exposure (EAD) on this client, therefore, will rise. If the credit rating of the counterparty decreases, then the PD (probability of default) goes up.

8

If the yield curve is upward sloping, then the short-term rates are lower than the longer term rates. It is then profitable (at least in the short run) to borrow for shorter terms and lend for longer terms.

9

The duration of a bank's assets is usually greater than the duration of a bank's liabilities. If the yield curve steepens this means that the interest rates for the longer terms go up relative to those for shorter terms. The assets have a longer term and thus their value decreases (as a result of a rise in the long-term rates). The liabilities have a shorter term and their value will go up. (as a result of a decrease in the short-term rates). In both cases this is bad news for a bank and, as a result, the bank's equity will fall.

10

The items are slotted according to their remaining interest term, i.e. two months.

11

If a bank buys a ten years IRS for instance fixed against 3 months LIBOR it has to plot the floating leg into a short-term bucket.

12

The assets of a bank usually have a longer duration than the liabilities. Therefore the bank should decrease the terms of its assets and increase the terms of the liabilities.

13

The main parameter that determines the duration is the average term of the cash flows. Since a zero-coupon bond only has one cash flow (i.e. the amortization) the average term of the cash flows is the same as the term of the amortization.

14

You should either convert a received fixed rate to a floating rate or a paid floating rate to a fixed rate. This can only be done by paying fixed and receiving floating in an IRS for the term of the portfolio

15

As a result of the sale of the bond, the credit risk becomes smaller. The bank, however, is now faced with an open position and the market risk rises.

16

If the creditworthiness of the reference entity increases, then the value of the CDS increases too. Your exposure to the seller increases and, therefore, your counterparty credit risk increases.

