CALCULATING THE FORWARD RATE

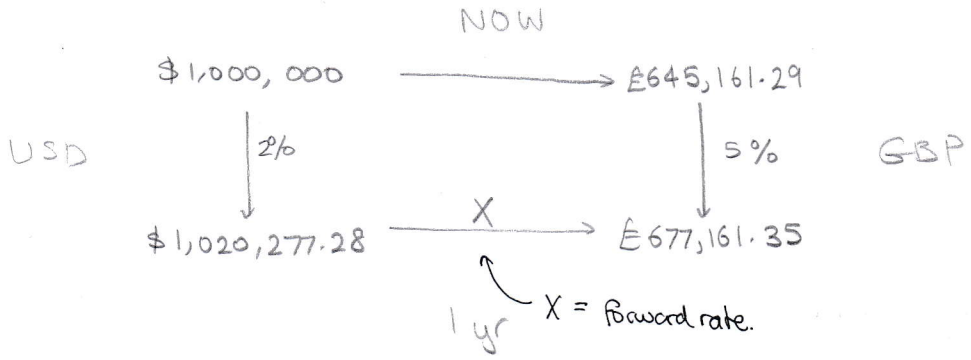
$1,000,000 to invest in sterling-denominated stock.
You are not permitted to be exposed to exchange rate risk.
Must set rate at which you will re-convert the sterling into dollars when you enter the investment.
2% interest in Eurodollar market for 1yr or 5% in Euro-Sterling.

$$\$1{,}000{,}000 \times \left[1 + 0.02 \times \left(\frac{365}{360}\right)\right] = \$1{,}020{,}277.78 \leftarrow \text{earned if invested in USD.}$$

$$\$1{,}000{,}000 / 1.55 = £645{,}161.29 \leftarrow \text{spot amount in GBP.}$$

$$£645{,}161.29 \times \left[1 + 0.05 \times \left(\frac{365}{365}\right)\right] = £677{,}161.35 \leftarrow \text{earned if invested in GBP.}$$

$$X = \$1{,}020{,}277.78 / £677{,}419.35 = 1.5061$$



If interest rate differential changes during the contract duration, you get profit/loss.

e.g CAD forward at 1%, then drops 10 basis points. ← 10 b.p. = 0.1%.
(100 b.p. = 1%).

You have fewer CAD at end than you should have.

You will experience a loss.

FORWARD POINTS

	Spot	Forward Points	Forward Rate
GBP	1.5500	- 0.0439	1.5061

The forward rate neutralises the interest rate differential.

CALCULATING FORWARD POINTS.

Forward points = $S \times (E2 - E1) \times (T/360) \times 100$.

- S = spot rate
- E1 = dominant interest rate
- E2 = secondary interest rate
- T = number of days to maturity.

What are 1yr forward points for EUR/USD?

Spot = 1.0110
1yr EUR = 2.97 %
1yr USD = 1.52 %
T = 365

points = $1.0110 \times (1.52 - 2.97) \times (365/360) \times 100$
= -148.6

- Pay points if you benefit from having deposit in higher interest rate
- Earn points in the opposite case.

e.g. If you buy GBP forward against USD
- USD interest rate lower than GBP
- You will not earn the differential
- Therefore, you earn the forward points
- You will buy GBP at a lower, more advantageous rate.

Customer rate = 1.5500
points = −0.0439
rate = 1.5061

−10 GBP = +15,061,000 USD

e.g. You sell CAD forward 1yr against USD (as the client).

EUR USD rates = 5.0%
EUR CAD rates = 7.0%
Spot = 1.45

forward points = $1.45 \times (7.0 - 5.0) \times (365/360) \times 100 = 0.0294$
forward rate = 1.45 + 0.0294 = 1.4794

+294 points

You pay points because you earned interest rate differential.

e.g. You wish to buy CHF forward 1 yr against USD.

Euro USD rates = 5.0%

Euro CHF rates = 4.0%.

Spot = 1.52 USDCHF

Points = $1.5200 \times (4.0 - 5.0) \times (365/360) \times 100 = -0.0154$ (-154 points)

Rate = $1.5200 - 0.0154 = 1.5046$.

e.g. Customer rate = 1.5200
Points = - 0.0154
Rate = 1.5046

} 10 CHF = 6,646,284.73 USD.

PREMIUM vs DISCOUNT POINTS.

Premium: minor currency rate is higher than dominant interest rate.

Bid is always quoted higher than the offer.

e.g. 1yr USDCAD is quoted 215/220

Points will be added to the spot rate. ← points more RHS as interest widens

Discount: Bid quoted higher than offer.

e.g. 1 yr EUR/USD is quoted 149/148

Points will be subtracted from the spot rate. ← points more LHS as interest widens.

e.g.

Currency	Spot	Interest rate
USD		5.00%
GBP	1.600	4.50%
EUR	0.9900	5.50%
JPY	120.00	4.75%.

1. You wish to buy sterling forward against dollar. The forward points are 0.0542.

Pay the points, forward rate = 1.600 + 0.0542 = 1.6542.

You are staying in high interest rate currency, you have to pay points.

Since you are paying more dollars per pound in the future than you would today, you have paid the points.

2. You want to sell Euro forward against the dollar. Forward points are 0.0756.

Pay the points, forward rate = 0.9900 − 0.0756 = 0.9144

This is because you're selling the Euros forward, you have remained in high interest rate currency.

3. You buy a Yen forward against the dollar. The forward points are 1.05.

Pay the points, forward rate = 120.00 + 1.05 = 121.05.

As buying Yen forward, you're staying in high interest rate currency.

e.g. Buy sterling forward, where GBP < USD, pay points.
Sell Stirling forward, where GBP < USD, earn points.
Buy Euro forward, where EUR > USD, earn points
Sell Euro forward, where EUR > USD, pay points.

FORWARD DATE CONVENTIONS.

- Date-to-date : Today July 6th, 1 month forward Aug 6th.
- Holiday/weekend : Moves to next mutual business day.
- End-to-end : If spot date is last business day, forward date must also be last.
  e.g. Nov 30th, Dec 31st.

CALCULATING ODD DATES.

e.g. Client wants to B/S Eur for value date May 29, 2003.

May 29 = 197 days
6-months = 181 days = −83.2 bid.
7-months = 212 days = −95.5 bid.

Calculate average forward points between 6 and 7 months by interpolation:

$$(83.2 - 95.5) \times \frac{(197 \text{ days} - 181 \text{ days})}{(212 \text{ days} - 181 \text{ days})} = -6.35.$$

Outright : A spot deal for some value date in the future.

e.g. Spot EURUSD is 1.0125/30
1yr EURUSD is 149/148

If client wants to buy 1 yr EURUSD outright, price is 1.0130 − 0.0148 = 0.9982.

Swap : - Client simultaneously buys and sells an even amount of currency for two different value dates with same counterparty.

- Some clients do swaps because they have foreign currency receivables collected in advance of their payables, and want to make use of non-foreign currency equivalent in meantime.
- They may also be used to hedge interest rate risk.
- Some clients also don't want to take delivery of a particular currency

e.g. If a client was due to receive JPY on a certain date, they may sell JPY for spot and buy it forward, giving them the ability to lock in profits at that level.

e.g. SELL 50 EUR for spot @ 1.0010
BUY 50 EUR for value date 1 year @ 0.9865.

WHICH SIDE OF THE MARKET.

To determine which side of the market to deal on, always look at whats happening on the forward leg (or far leg) of the trade.

e.g. 1 year EURUSD is trading at 146/145.

Client wants to swap where they Sell and Buy EURUSD for 1 year.

- 12M : −146.00/−145.00

Client is buying EURUSD forward, so they would "take the offer" or "deal on RHS" at −145 i.e.

10 EUR	1.0010	10,010,000 USD.	11/11/03
	−0.0145		
9,865,000 USD	0.9865	10 EUR	11/13/03.

CURRENCY FUTURES.

- Specific types of outright deals, traded on exchanges.
- Standard settlements on 3rd Wed, of every 3rd month (March, June, Sept, Dec)
- Currency future price = 1/ outright price for maturity date.

FUNDING

- The forward desk is funding arm of firm's currency balances.
- Everyday they come up with a net position of firm's currency balances, making positions flat at end of each day to ensure proper payments are made.
- Forwards desk funds positions by Tomorrow/Next or T/N swaps.
- Clients may also "roll" their positions to the forward desk to any date in the future.

TRADE IDEAS.

e.g. One-year JPY is trading @ 206/204.

Buy $10 USD, sell JPY for spot @ 124.50

Sell $10 USD, buy JPY for value 1-year @ 122.44.

Looking for interest rate to widen, specifically higher USD rates as we are borrowing USD today and lending them out in the future.

We enter into an even swap, which creates a spot equivalent position.

- buy JPY @ 124.50 and sell JPY@ 122.44, a 1.7% difference.
- present value of $10 1 year out @ 1.7% is $9.35
- $10 - $9.35 = +$650,000 (long) spot equivalent
- Normally, we hedge the position by selling USDJPY.

EURODOLLAR FUTURES.

Dec 02	98.58
Mar 03	98.53
Jun 03	98.26
Sep 03	97.89
Dec 03	97.46

Jun 03 contract implies 3 month rates are expected to be 100 - 98.26 = 1.74% at that time vs cash today at 1.42.

POSITIVE CARRY TRADE.

USDJPY

Spot/Next points : - 0.45

3-yr points: - 1040 or (- 0.95 per day).

Trade: Sell / buy $10 USDJPY three years out, leaves us short USD and long JPY, until far leg of trade.

Carry: Each day, we find our short USD position at 0.45 per day, and earn 0.95 per day on forward leg.

This is a positive net carry trade of 0.5 per day.

Analysis: Positive carry = 10 USD × (0.005/120.00 (spot)) = $417 per day.

Position: However, we overlent USD and thus benefit from rates going down.

Therefore, we are looking for rates to move lower.

Evaluation: If the bid/ask spread on 3-yr is 20 points, we would pay $16,000 (0.0020 × $10,000,000).

At a positive carry of 0.5 we would need 40 days (20 days / 0.5) of steady rates, or rates moving in our favour, to break even.

Points moving in our favour would shrink/ eliminate the large bid-ask spread.

FORWARDS REVIEW PROBLEMS

	Euro	AUD	NZD	JPY	GBP	CAD
Spot	0.9957	0.55885	0.4982	124.64	1.56865	1.5557
1mo	13.9/13.8	16.2/16	19/18.7	17.3/17.2	33.4/33.3	18.8/19.2
2mo	27.3/27.1	32.4/32.1	38.5/38.1	31.8/31.5	67.65/67.35	37.5/37.8
3mo	39.1/38.9	46.8/46.4	54.9/54.4	45.3/44.9	98.5/98.2	55/56
6mo	75/74.7	92.3/91.8	109/108	91/90	198.5/197.5	111/113
1yr	129.25/128.25	174.8/173.8	207/204	204/202	384/381	214/218.

note: higher bid implies points at discount.

1. Customer wants to:

(a). Sell/Buy EUR 3 mo. out: ← mm sells base on RHS if customer buys base.

Buy EUR in the future means RHS, so forward price is 0.9957 − 0.00389 = 0.99181

(b). [redacted]

Sell/Buy JPY 6 mo. out

Sell USD in the future means LHS, 124.64 − 0.91 = 123.73.

(c). Buy/Sell CAD 1 yr out

Buy USD in the future means RHS, 1.5557 + 0.0218 = 1.5775.

(d). Buy/sell USD vs. NZD 1 mo. out.

Buy NZD in future means RHS, 0.4982 − 0.00187 = 0.49633.

(e). Sell/Buy USD vs. CAD 2 mo. out.

Buy USD in future means RHS, 1.5557 + 0.0378 = 1.55948.

(f). Buy/Sell [redacted] USD vs. AUD 1 yr out.

Buy AUD in future means RHS, 0.55885 − 0.01738 = 0.54147

(h). Sell/Buy USD vs. EUR 2 mo. out.

Sell EUR in the future means LHS, 0.9957 − 0.00273 = 0.99297.

2. If forward desk buys/sells $10 USD/JPY 1 yr. forward, will desk have long/short spot equivalent position?

We are buying USD/JPY for value spot and selling USDJPY for value 1 yr forward. Since the present value of our short position is less than the present value of the current long spot position, we have a net long spot equivalent position.

3. If Sep 03 Eurodollar futures are trading @ 97.93, what is the expectation for 3 mo. rates at that time? Overnight rates?

100 - 97.93 = 2.07, expected at 3 mo. rates.
3 mo. rates are typically 10-12 points above overnight rates, e.g. 1.95 - 1.97.

4. If we expect EUR rates to go down and/or US rates to go up, what position should we take using swaps to capitalize on this?

We would overlend, or sell and buy EUR to match this view.
We would be borrowing EUR at a future date, so it makes sense to be looking for lower rates.
On the other side, we are lending out USD, so looking for USD rates increase.

5. If we expect CAD rates to go down and/or US rates to go up, what position should we take?

Buy and sell USD, sell and buy CAD.
Tricky part is we're going short USD/CAD since we are buying CAD out in the future and selling USD.

6. If we sell and buy GBP 3 mo. out, what is expectation for GBP vs. USD rates?
Expect GBP rates to go down and/or US rates to go up.