FX Futures Explained

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An FX future is a financial contract that fixes the exchange rate today at which a specified quantity of currency will be delivered on a future date.

By using a currency future contract, the parties are able to effectively lock-in the exchange rate for a future transaction. Speculation and hedging in currencies can be achieved primarily through future contracts.

Futures are contracts traded on exchanges with standardized terms as opposed to OTC ones.

When a party establishes a position in a futures contract, it can either run this position to maturity or close out the position before expiry. If a position is closed out, the parity will have either a profit or loss to book

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- There are two types of delivery: cash delivery and currency delivery. In cash delivery the counterparty with long position will receive X – K where X is the exchange rate at maturity and K is the strike.
- In currency delivery, the counterpart with long position will buy a number of size U currency and pay K * size in currency Y.
- The Investors use FX futures to hedge against foreign exchange risk. In fact, FX futures are one of the main methods used to hedge against exchange rate volatility, as they avoid the impact of currency fluctuation over the period covered by the contract.

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- Because FX futures are marked-to-market daily, investors can exit their obligation to buy or sell the currency prior to the contract's delivery date.
- There is no counterparty credit risk associated with futures as the role of the exchange clearing house.
- A clearing house acts as the buyer to all contracts sold on the exchange.
- By locking-in an exchange rates, the party forfeits the opportunity of profiting from a favorable exchange rate movement.

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- The spot date is the day the two parties actually exchange the two currencies.
- Given a quotation date or trade date, the corresponding spot date is computed from the spot date convention of the currency pair
- The simplest way to do this is to add the number of spot days as business days to the quotation date using both holidays for the pair.

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- Given spot rate X_s , spot date T_s and forward date T, the FX forward rate can be represented as

$$\begin{cases} X_f = X_s \dfrac{D_b(T_s, T)}{D_q(T_s, T)} & if \;\; T \geq T_s \\ X_f = X_s \dfrac{D_q(T, T_s)}{D_b(T, T_s)} & if \;\; T < T_s \end{cases}$$

where

X_s	the spot FX rate quoted as base/quote
t	the valuation date
T_s	the spot date (several days after the valuation date)
T	the forward date
$D_b(T_s, T)$	the discount factor of base currency
$D_q(T_s, T)$	the discount factor of quote currency

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- The Foreign Exchange Futures value at the maturity date is given by

$$PV(t) = X_f - K$$

- It can also be written as

$$PV(t) = N_b D_b(t,T) X_0 - N_q D_q(t,T) + C$$

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where

t	the valuation date
T	the payment date
X_s	the spot FX rate quoted as base/quote
$D_b(t,T)$	the discount factor of base currency
$D_q(t,T)$	the discount factor of quote currency
N_b	the notional principal amount for base currency
N_q	the notional principal amount for quote currency
C	a constant used to match the market price.

Thank You

reference:

https://finpricing.com/lib/EqVariance.html