FX Forward Contract Explained

FX Forward Contract Overview

- An FX forward is an obligation to exchange a particular amount of one currency for a certain amount of another currency at a specified future time.
- The contract is composed of two legs: Pay Leg and Receive Leg. Its value is the difference between the Receive Leg and Pay Leg.
- FX forward settlement can either be on a cash or a delivery basis, provided that the option is mutually acceptable and has been specified beforehand in the contract.
- Forward contracts are one of the main methods used to hedge against exchange rate risk, as they avoid the impact of currency fluctuation over the period covered by the contract.

FX Forward Contract Overview (Cont.)

- FX forwards are an effective hedging vehicle and also allow buyers to indicate the exact amount to be exchanged and the date on which to settle in the forward contract.
- If an investor will receive a cashflow denominated in a foreign currency on some future date, that investor can lock in the current exchange rate by entering into an offsetting FX forward position that expires on the date of the cashflow.
- By using FX forward contracts, investors can protect costs on products and services purchased abroad or protect profit margins on products and services sold abroad lock-in exchange rates as much as years in advance

FX Forward Contract Overview (Cont.)

- The value of an FX forward contract is the sum of the discounted future cashflows combined into a common currency. There are two possibilities depending on the order in which discounting and currency conversion is done:
- A. Discount the cashflows using the zero curves of the two currencies and then convert the results to one currency using the FX rate on the value date.
- B. Convert the cashflows to a common currency using forward FX rates on the cashflow payment dates and afterwards perform the discounting using the curve of the resulting currency.

FX Forward Contract Overview (Cont.)

- If forward FX rates are available, Method B is used, as the forward points are required for doing the future conversion.
- if forward FX rates are not available in the market data set then Method A is used.
- When currency conversion is done for the present values of cashflows, there are two choices for the FX rate. The first choice is to employ the spot FX rate quoted on the valuation date (the date for which the present value was computed). The second choice is to use "Today's Rate", which is the FX rate that could be applied on the valuation date itself if the currency exchange were to be completed on that day.

Forward FX Rate

- 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

Pricing

- The present value of an FX forward contract is given by

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

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

Thank You

Reference:

http://localhost/lib/EqBarrier.html