Linear Instruments

I)   Plain Vanilla Swaps

General Description
Plain vanilla swaps (interest rate swaps) represent a contractual agreement to exchange fixed interest payments for floating interest payments on a specified notional principal. The floating rate equals a reference rate (money market rate, such as the EURIBOR). The fixed interest payments (swap rate) are usually set in such a way that the swap is worth zero initially. The dates on which the payments must be effected are set in advance. An interest rate swap is generally structured such that one side remits the difference between the two payments to the other side. Moreover, the (notional) principal is not exchanged at the end of the life of the swap.

On each interest payment date the fixed-rate payer must transfer EUR 5 to the fixed-rate receiver. On the first coupon date the fixed-rate payer receives EUR 4.75 (pre-set first variable payment) from the fixed-rate receiver. At the same time, the successive variable payment is set at the current 12-month EURIBOR.

Replication
A swap buyer pays fixed coupons and receives variable interest payments in return (payer's swap). In other words, he or she is long a floating rate note and short a coupon bond (the redemptions of the nominal values at maturity cancel each other out).

+ Payer's swap = +FRN - coupon bond

where
+= long position
-= short position

The FRN and the coupon bond can be decomposed further into zero coupon bonds. The seller pays floating interest and receives fixed interest (receiver's swap), i.e he or she is long a coupon bond and short a floating rate note.

+ Receiver's swap = +coupon bond - FRN

where
+= long position
-= short position

Valuation
Since plain vanilla swaps can be mapped into a coupon bond and a floating rate note, valuation is very straightforward. The relevant spot interest rates are used for this purpose.

II)   Forward Rate Agreements (FRAs)
General Description
A forward rate agreement is an over-the-counter agreement that a certain interest rate (contract rate) will apply to a certain principal (contract amount) during a specified future period of time (contract period). The buyer and seller of an FRA agree on a future money market transaction. The seller guarantees the buyer a future loan at the specified conditions.

The buyer hedges against rising and the seller against falling interest rates. While the contract rate may, in principle, be chosen at will, it is usually set such that the present value of the FRA is zero at initiation.

Replication
Forward rate agreements may be mapped into two zero coupon bonds. At settlement the buyer of the FRA basically receives the nominal discounted at the contract rate, which he or she pays back at the end of the contract period.

+ FRA = +zero coupon bond(1) - zero coupon bond(2)

where
+= long position
-= short position
Zero coupon bond(1): due at the beginning of the contract period; the principal corresponds to the contract amount discounted at the contract rate
Zero coupon bond(2): due at the end of the contract period; the principal corresponds to the contract amount

Valuation
Since an FRA may be mapped into zero coupon bonds, valuation, which is based on the spot rate, is uncomplicated.

Otmane El Rhazi is a securities trader, where he execute transactions on commodities, forex and equities. El Rhazi uses various technical and fondamental indicators to optimise the financial gain.