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Other Derivatives

The three main derivative securities (futures, swaps and options) have been discussed at length in preceding chapters. This chapter covers other derivatives, in brief. Analytically, many of these derivatives can also be viewed as being constructed from the basic building blocks of futures and options, an exception being event-based derivatives which are closer conceptually to insurance contracts.

Forward rate agreements

A forward rate agreement is a contract, generally entered into between a bank and a customer, which gives the latter a guaranteed future rate of interest to cover a specified sum of money over a specified period of time in the future. A forward rate agreement (FRA) does not involve actual lending or borrowing of sums of money. It is merely an agreement which fixes a rate of interest for a future transaction. At the time when the customer actually requires funds, he has to separately borrow the money in the cash market at the rate of interest prevailing then. If the rate of interest payable in the cash market turns out to be higher than the rate of interest fixed in the FRA (entered into earlier), the bank which signed the FRA will pay to the customer the difference in the interest rate. However, if the rate of interest payable in the cash market turns out to be lower than that fixed in the FRA, the customer has to pay the difference in the rate of interest. This transaction is known as purchase of a FRA from the bank.

It is worth repeating that no actual lending or borrowing is involved in the FRA. If the customer eventually decides not to borrow the sum of money, no amount is payable from or to the bank. While reference was made to a customer intending to borrow, it is also possible for a customer to enter into an FRA for his deposits. A customer may wish to have a guaranteed rate of interest for a sum of money which he intends to deposit at a future point of time. He can enter into an FRA with a bank. He has to separately make a deposit in the cash market at the appropriate point of time. If the market rate on his deposit turns out to be lower than that guaranteed in the FRA, the bank will compensate

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him for the difference. On the other hand, if the deposit interest rate turns out to be higher than what was fixed in the FRA the customer has to pay the difference to the bank. This transaction is known as sale of a FRA to the bank.

For this reason, purchase of a FRA protects against a rise in interest rate where a company needs to borrow from a bank. Sale of a FRA protects against a fall in the interest rate where a company needs to deposit money with the bank. The bank charges different interest rates for borrowers and lenders and the spread between the two constitutes its profit margin. Generally, no other fee is payable for FRA contracts.

As hedging instruments, FRAs are substitutes for short term debt futures, but being OTC, the size and terms can be customised.

Range forwards

Range forwards are an instrument found in the foreign exchange markets. They are essentially a variation on the standard forward exchange contracts and are also known as flexible forward contracts. In such contracts, instead of quoting a single forward rate (for example three months forward rupee at ₹ 59.8 per $), a quotation is given in terms of a range. The forward rupee would be quoted at '₹ 59 to 61'. If the spot exchange rate on the maturity date is between these two levels, then the actual spot rate is used. If the spot rate rises above the maximum, then the maximum level is used. If the spot rate falls below the minimum, the minimum rate is used. Range forwards differ from normal forward contracts because they:

a. give the customer a range within which he can benefit or lose from exchange fluctuations; and
b. provide protection from extreme variation in exchange rates.

The risk-return profile of range forwards is very similar to that of a 'foreign exchange collar' in the currency options market. For an illustration of the collar mechanism, albeit in the context of equity options, see Example 13.1.

Swaptions

A 'swaption' is a contract by which a party acquires an option to enter into a swap. A call swaption gives the purchaser a right to enter into a swap as the fixed rate payer. A put swaption gives the purchaser of the swaption the option

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of entering into a swap as a floating rate payer. A swaption has got a strike rate (denominated in terms of the fixed rate payable) and a maturity date which can be either on European or American terms. Swaptions can be used to hedge uncertain cash flows. For example, a company may not be sure whether a tender which it has bid for will be awarded to it. If the bid is successful it may have to enter into a swap. To hedge such *contingent borrowing*, it can enter into a swaption.

Commodity-linked loans and bonds

These are instruments, first designed in the eighties, primarily to meet the needs of companies and countries whose earnings are closely linked to commodity prices. A commodity-linked bond would involve a loan to a borrower in which the interest payable and/or repayment schedule is linked to a commodity price. If the commodity price rises, the debt service obligation increases by a predetermined margin. If the commodity price falls, then the debt service obligation is also reduced, though there is often a minimum debt service obligation. The positive correlation between the commodity price and debt service, reduces hardship to the commodity producer. For the lender, the bond reduces the risk of default since repayment is linked to 'ability to pay'. These bonds are (analytically) equivalent to a combination of a conventional loan and an option on the commodity price.

Interest-only (IO)/principal-only (PO) strips

These are synthetic securities which split up the interest and principal elements of a security, and allow the holder to receive a return based on one component alone. Thus, an IO strip holder receives *interest only* on a particular type of asset (say a securitised pool of mortgage loans or treasury bonds), but *no principal payments*. A PO strip or IO strip costs much less than the underlying asset itself. These instruments are useful to financial institutions in matching their assets with their liabilities. For this reason, these and similar derivatives are sometimes known collectively as 'asset/liability-based derivatives'.

Equity-linked bonds and notes

These are bonds linked to a *specified equity index*. If the equity index rises, the bond earns higher return and vice versa. In *protected equity linked bonds* both principal repayments and a pre-set minimum coupon rate are fixed (i.e., 'protected') but additional returns are payable depending on the performance of a specified index or indices. The protected (minimum) coupon interest rate is lower than the normal bond interest rate – the sacrifice is the consideration paid for the opportunity of higher earnings through equity index appreciation. These instruments are usually used by pension funds, insurance companies, etc. Analytically, they are a combination of a conventional loan with equity options.

Event-based derivatives

Event-based derivatives are those where the pay-off is based on the occurrence of a specified event. If the event does not occur, one of the parties may not receive a pay-off.

Credit derivatives

Credit derivatives are an example of event-based derivatives. The event in question is the occurrence of default in servicing of a loan. The interest rate on a loan has three components:

a. the borrowing cost for the bank or institution (e.g., deposit interest rate prevailing in the market);
b. loan-deposit spread, being the normal profit margin of the bank; and
c. a credit risk premium or spread depending on the credit-worthiness of the borrower.

Credit derivatives involve the third element, i.e., the credit risk premium. A typical credit derivative is a 'credit default swap' (CDS) in which one party 'swaps' the *default risk (credit risk) alone* with a counterparty; the latter agrees to pay the first party in the event of a default by the borrower, but receives a regular payment in return. (Conceptually this is equivalent to a guarantee in return for guarantee commission.)

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Example 15.1

B, a bank, has lent heavily to D, a developing country. D has asked for further loans. B is worried at 'having too many eggs in one basket', but at the same time does not want to forgo the business and the profits therein especially as its rival bank may get an entry into the country if it does not lend. It therefore gives the loan to D at 10 per cent but enters into a default swap with C, an institution with no exposure to D so far. It agrees to pay C 2 per cent per annum in exchange for C covering the default risk.

Credit derivatives are a useful means of spreading default risks. They do not alter the lender-borrower relationship. In the above example, the borrower is in no way involved in the swap. Credit derivatives allow lenders to continue to lend and earn normal banking profits (deposit-to-loan spread) without assuming the credit risk.

CDS are called swaps, but analytically are not really swaps because there is no exchange of cash flows. Rather, there is a fixed cash flow in one direction; in the other direction there may or may not be a cash flow depending on whether or not a particular event happens. If the event does not happen, the cash flow remains one-sided. The use of the term 'swap' is linked to the desire of CDS buyers and sellers in the USA to keep them out of the scope of insurance regulation. CDS played a role in the global financial crisis of 2008 (see Appendix 1.1).

Weather and catastrophe derivatives

In recent years, derivatives linked to specified weather events and to natural disasters have been developed. For example, a weather derivative contract may specify that if the rainfall in a specified area exceeds a pre-set level, then a pre-specified payment will be triggered. A catastrophe derivative contract may specify that if an earthquake occurs in a particular area, a payment will be triggered. Catastrophe bonds – sometimes but not always considered as derivatives – are bonds where the borrower is allowed to reduce or defer debt servicing when a specified catastrophe occurs. Because of this, they would normally have a higher coupon than an ordinary bond.

Like CDS, these are also event-based derivatives: one of the parties makes a fixed payment. The other party may or may not make any payment depending on the occurrence or non-occurrence of the specified event. Weather and catastrophe derivatives are alternatives to traditional insurance.

Other complex and synthetic derivatives

Using the building blocks of futures and options it is possible to construct a number of complex derivative instruments. Complex derivatives can be designed to suit the particular needs and circumstances of a particular client. International banks and brokers structure such specialised derivatives, known as 'synthetic' (or custom-made) derivatives. A number of such instruments have been churned out by derivatives specialists (especially those in Wall Street who became known as the 'rocket scientists' because of the complexity of their designs). Some such complex instruments have subsequently become widely used and available OTC from financial intermediaries. The precise financial implications of a complex or custom-made derivative can be quite difficult to unravel. A client entering into a complex or custom-made derivative transaction should be very careful in understanding in advance the likely financial outcomes in various circumstances.

The commodity-linked and equity-linked bonds referred to in this chapter are examples of complex derivatives which started off as custom-made instruments for particular clients. The 'rainbow options', 'barrier options', amortising swaps etc., referred to in earlier chapters are other examples of complex derivatives.

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