9

Swaps – Part II
Other Swaps

This chapter looks at some more kinds of swap transactions and at certain general issues relating to swap markets.

Equity swaps

An equity swap is an arrangement by which one party pays to the counter-party an amount based on the value of the shares in a company, and receives from the counter-party an amount of fixed or floating interest on an equivalent notional value. In effect, an equity position is converted into a deposit or debenture.

Example 9.1

X Ltd owns a large stake of one lakh shares in Y Ltd, a quoted sister company. The shares are currently quoted at ₹1,000 per share. X is apprehensive that the price of Y's shares may fall, but does not want to sell its stake as that would mean relinquishing its say over the management of Y Ltd. Instead it enters into an equity swap with Z Ltd, a financial institution, whereby

i. X will pay Z annually the value of all dividends declared by Y plus or minus any net appreciation or depreciation in the share price (from the base value of ₹1,000) on its one lakh shares.

ii. Z will pay X annually the market floating rate of interest on a sum of ₹10 crore, being the market value of X's holding at the time of the swap.

Financially, the effect of an equity swap is the same as that of selling the shares outright. However, the shareholder may wish to retain the shares for reasons of control (as in the Example above) or to avoid capital gains tax, or to avoid giving a negative signal to the market. (For example, a sale of Tata Motors shares by Tata Sons might provoke general bearishness in Tata Motors shares, which can be avoided through an equity swap.) The disadvantage is that there is a transaction cost. Depending on the prevailing market sentiment, a premium may have to be paid by one or other party to attract the counterparty and there will usually be a margin for the intermediary.

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Commodity swaps

A commodity swap is an arrangement or a contract by which one party (a commodity user/buyer) agrees to pay a fixed price for a designated quantity of a commodity to the counter party (commodity producer/seller), who in turn pays the first party a market-based price (or an accepted index thereof) for the same quantity. Commodity swaps are a means of hedging commodity price risk, over a long period.

Example 9.2

B Ltd, a British chocolate manufacturer, is apprehensive of adverse fluctuations in cocoa prices. G Ltd, a Ghanaian cocoa producer, wishes to ensure a steady income over a five-year horizon. B and G enter into a commodity swap through an intermediary on the following terms:

i. *B will pay quarterly to G a fixed price of $2,700/tonne over the five-year period, for a quantity of 5000 tonnes per quarter.*

ii. *G will pay quarterly to B a floating price for 5,000 tonnes which shall be the price of the nearest London cocoa futures contract as on the last day of the previous quarter.*

It should be noted that no cocoa is actually delivered – only a financial payment is made.

Assume cocoa prices fall. G will get a reduced income from its cocoa exports to various buyers; however the amount it has to pay to B under the swap will also fall, whereas the amount it receives from B is unchanged. Thus, it gains on the swap, compensating for its loss on actual physical sales.

Now suppose cocoa prices rise. B will be forced to pay more to its various suppliers of cocoa. However, it will also receive more from G under the swap, with its payment to G remaining unchanged. Thus, it gains on the swap, compensating for the loss in physical purchases.

Readers will notice in Example 9.2 that effectively the commodity swap is equivalent to a long-term fixed price contract between B and G. Why not then just enter into such a contract instead of all the complicated transactions involved in a swap? The advantage is that the swap leaves B and G free to buy/sell their actual cocoa supplies from/to other parties. Perhaps the variety produced by G may not be the one B needs at a future date, or G may have a transport cost disadvantage and so on. Thus, the swap leaves both parties with full operational flexibility in the spot market, but without price risk. The disadvantage is the transaction cost, fees etc. Depending on prevailing sentiment, one of the parties may also have to pay a 'premium' to attract the counterparty.

Example 9.3

A conglomerate, C needs 1 million barrels each of oil two years from now and three years from now. It wishes to hedge the price risk. The forward price for two years is $100 per barrel, and for three years is $105 per barrel. An oil-trading firm Z offers to pay the prevailing market price at the desired time in exchange for either a lump sum paid now or two equal payments in years two and three. The interest rate (yield to maturity) on two year and three year bonds are 7 per cent and 8 per cent respectively. How much can C pay to the swap counterparty Z without suffering a loss?

Solution:

If the risk is hedged on the forward market, the price that C will pay is:

$100 million after two years + $105 million after three years.

The present value of that amount is:

$100/(1.07)^2 + 105/(1.08)^3$

or $170.69 million.

If the conglomerate had to make equal (nominal) payments for year two and three, then the payment which would be equivalent to the sum of $170.69 million (denoted by 'P') would be:

$(P/1.07^2 + P/1.08^3) = P(1/1.07^2 + 1/1.08^3) = 170.69$

i.e., P = $102.38 million.

Therefore, C can afford to pay either one lumpsum of $170.69 million now or pay two equal instalments of $102.38 m in years two and three; C would be insulated from any changes in the price of oil in the interim, no matter what the oil prices would be then. In this example, the fixed rate payer is the conglomerate and the floating rate payer is the oil trader.

If the lump sum is paid up front, such an instrument is known as a pre-paid swap. Apart from the need for C to put up the cash up front, the disadvantage of this is the credit risk of the counterparty to C, i.e., what if Z fails to perform the obligation at the due date? On the other hand, if no pre-payment is made, there is a credit risk for Z – what if C defaults on the obligation even though Z has incurred risks?

In practice, the counterparties rarely deal with each other – instead they deal with broker-dealers. The broker-dealer is usually a well-known institution and this makes it easier for the counter-parties to go through with the transaction without having to worry about the risks of dealing with an unknown, and possibly foreign, entity. Such a situation is called a back-to-back transaction and the broker-dealer does bear the credit risk, though no price risk. There is still a credit risk to the swap parties – the risk of the broker itself defaulting. After

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the financial crisis of 2008, this risk can no longer be completely dismissed, but it is usually easier to assess than the risk of a less-known counterparty.

Commodity swaps vs futures as hedges

The main advantage of commodity swaps over futures is that these are long-term hedging instruments. Swaps may, however, be costlier to arrange. An additional reason for using swaps could be non-availability of liquid futures markets in some commodities. For instance, in the previous example, there was an assumption that there was a known forward price for oil for delivery three years from now. If such a market were not available, then swaps might offer the only means of hedging.

Exotic swaps

The kind of swap transactions depicted in the previous chapter under interest rate swaps are known as 'plain vanilla' or plain swaps. More complicated swaps have evolved to meet specialised needs. Some of these are discussed below. (While exotic swaps are described below in terms of interest rate swaps, for most of them there is an equivalent in the currency swap market and other swap markets also.)

Basis swaps

A basis swap is one where two parties swap floating rate payments but the two floating rate payments are determined by different indices. (Readers may recall that in the context of swaps, the term 'index' refers to the benchmark rate of interest for determining the floating rate.) For example, one party may have payments dominated at LIBOR + 2 per cent, while the other's payments are dominated at treasury bill rate + 1 per cent.

Forward swaps

A forward swap is an arrangement by which a swap is entered into with a commencement date in the future. It is like a forward or a future contract on a swap (which itself is the conceptual equivalent of a strip of forwards or futures – see below).

Callable swaps

In a callable swap, the fixed rate payer has an option to terminate it before maturity. The right to terminate comes at a price reflected in a higher fixed rate than an ordinary swap, and possibly a termination fee.

Puttable swaps

In a puttable swap, the floating rate payer has an option to terminate a swap before maturity. The price for this option is reflected through a higher floating rate and in some cases a termination fee. (Puttable and callable swaps are also known as cancellable or terminable swaps.)

Extendible swaps

An extendible swap is one in which the fixed rate payer is given an option to extend the maturity date of the swap. This additional facility is reflected in a higher fixed rate and/or an extension fee.

Rate capped swaps

A rate capped swap is one where the maximum rate payable by the floating rate payer has a ceiling or 'cap'. This cap reduces the risk to the floating rate payer but reduces the benefit to the fixed rate payer. For this facility, the floating rate payer has to pay a premium to the fixed rate payer.

Amortising swaps

In such cases, the notional principal amount diminishes during the life of the transaction. This is in contrast to the plain or plain vanilla swap (the type covered in the examples) in which the principal amount remains the same. This type of swap is more suitable when a loan is repaid in several instalments.

There are various other types of swaps as there is no limit to the ingenuity of the financial markets in evolving more and more sophisticated instruments.

Swaps as a collection of consecutive futures

It can be shown that a swap is conceptually the equivalent of buying a string or 'strip' of futures contracts. A strip of futures is a set of futures of identical value but different maturities. (For example if one were to simultaneously buy one lot of April gold futures + 1 lot of June gold futures + 1 lot of August gold futures, this is called a 'futures strip'.)

A simple illustration of this can be found in Example 9.2 above. It was seen that the same hedge could be achieved either by a purchase of a strip of futures for a present value of $170.69 million or by a prepaid swap of $170.69 million or a post-paid swap of $102.38 million per annum in years two and three.

We can see that the swap price is not $102.50 (the simple average of the two forward prices) across different years, despite the same amount being bought. This is because of the time value of money, which pushes the swap price closer to the nearer term price rather than farther term price.

Example 9.4

F Ltd. owns 9 per cent perpetual bonds. In mid-2014, it apprehends a rise in interest rates which will reduce the bond price. To protect itself, it sells a strip of bond futures, i.e., one contract each of 10,000 Pounds of January 2015, January 2016 and January 2017 maturity[1] At the time – of sale of futures, the perpetual bond futures are priced at 100, since the prevailing long-term interest rate is 9 per cent. At the same time, LIBOR is 7 per cent. The actual rates of interest during the three years are as follows:

Time	*Market interest rate (per cent)*	*Perpetual bond price*
January 2015	*8*	*112.50*
January 2016	*10*	*90.00*
January 2017	*11*	*81.82*

The profit/loss on the bond futures is as follows:

Month	*Contract value*	*Sale price*	*Purchase price*	*Profit/Loss per bond*	*TOTAL*
Jan. 2015	*10000*	*100*	*112.5*	*-12.50*	*-1250*
Jan. 2016	*10000*	*100*	*90.00*	*+10.00*	*+1000*
Jan. 2017	*10000*	*100*	*81.82*	*+18.18*	*+1818*

1 In practice, bond futures for such long maturities may not exist. They are given here to illustrate the concept.

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Alternatively, suppose F had entered into a swap for 1,000 pounds and become the fixed rate payer at 9 per cent, receiving floating rate. Assume also that the floating rate index is the long-term bond rate and swap cash flows are perpetual.

The cash flows and the discounted present value of the swap position would be as follows:

Month	*Market interest rate (long-term) in per cent*	*Receipt at prevailing interest rate*	*Payment at 9 per cent*	*Net cash flow*	*Discounted value of swap at prevailing interest rate*
Jan. 2013	*8*	*800*	*-900*	*-100*	*-1250*
Jan. 2014	*10*	*1000*	*-900*	*+100*	*+1000*
Jan. 2015	*11*	*1100*	*-900*	*+200*	*+1818*

It may be seen that the value of the swap position exactly mirrors the profit/loss on the bond futures. (This example makes a number of simplifying assumptions to bring out clearly and simply the similarity between the two hedging instruments. The principle that a swap is equivalent to a string of future contracts, however, remains valid without these assumptions.)

Though a futures strip may, in theory, be equivalent to a swap, in practice there are usually no futures contracts running beyond two-three years (at the very most). Therefore, swaps occupy a niche position: they provide long-term hedging facilities.

Some features of the swaps market

Over the counter trading

Swaps are customised instruments and not standardised. Therefore, the swaps market is an over-the-counter market and there are no exchange-traded swaps. Because they are not traded through exchanges, the total volume of transactions cannot be quickly assessed. However, in some countries like Brazil, swaps are required to be registered through an exchange to enhance transparency and reduce counter-party risk.

Confirmations

The confirmation is the legal agreement that forms the basis of the relevant swap. The drafting is facilitated by the International Swaps and Derivatives

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Association (ISDA) in New York. A number of master agreements (or standard templates) can be used and customised. Regulatory pressure towards standardisation has increased since the financial crisis. The Dodd-Frank Act in the United States of America modified the Commodity Exchange Act by adding a new section – 'Confirmation, Portfolio Reconciliation, Portfolio Compression, and Swap Trading Relationship Documentation, Requirements for Swap Dealers and Major Swap Participants.' This mandates the Commission to prescribe standards for Swap Dealers and Major Swap Participants with respect to the timely/accurate confirmation, processing, netting, documentation and valuation of swaps.

Settlement of net amount

In the various examples, it was assumed that each party to the swap makes one payment and receives another. In practice, only the net amount due from one party to the other is actually paid. If the payment falls on a holiday, it is generally made on the next business day.

Mark to market valuation of swaps

When the purchaser first initiates a swap transaction, the market value of the swap instrument is invariably zero. That means that if the market does not move, both the parties can end up exiting the agreement – ignoring the transaction costs for now. Thereafter, the swap is valued at each settlement date based on the level of the index at that date.

Warehousing and market-making

When a company wants to enter into a swap, it goes through an intermediary, which is usually a special purpose subsidiary of a bank or major stockbroker. In order to enable them to respond quickly to clients' needs and earn their commissions, these intermediaries generally engage in 'warehousing'. They enter into one side of the swap transaction, say as fixed rate payer to a client who wants to be a floating rate payer. They then wait for a suitable counterparty and offload the swap to him. This means that users of the swap market need

not wait for locating a suitable counterparty. The 'warehousing' activity enables the intermediary to become a 'market maker'. This enhances the liquidity of the swap market.

Secondary market in swaps

It is possible to 'sell' a swap to another party with the agreement of the intermediary. The secondary market is, however, not very active and rather illiquid. The obligations in a swap can also be extinguished by 'unwinding' it, i.e., by reversing the transaction. The consent of the intermediary is, of course, necessary.

Credit default swaps

An important component of the present day swap market is the 'credit default swap'. However, while this is called a 'swap', it is not really an exchange of cash flows and is akin to a guarantee from one party in the event of another party defaulting on a credit risk. These instruments are therefore discussed in the chapter on Other Derivatives.

Economic functions of swap transactions

Financing function

Swaps, by exploiting comparative advantage, make funds available to borrowers at cheaper rates than would otherwise be possible. They therefore perform a financing function by making investment capital cheaper.

Arbitrage function

Interest rate swaps can reduce borrowing costs for both parties by exploiting the differences in the interest spreads in different segments (i.e., fixed vs., floating). Similarly, currency swaps exploit the differences in interest spreads between different currency segments. The availability of swaps tends to:

a. increase demand or reduce supply in the underpriced segment; and

b. reduce demand or increase supply in the overpriced segment.

By so doing, it actually tends to narrow the gap between the two segments. Swaps therefore act as an arbitrage mechanism which helps market integration and reduces interest rate distortions.

Hedging function

It was shown that swaps are analytically equivalent to a strip of futures transactions and that they can act as a hedge. Because of this, swaps perform the hedging function. Also, whereas futures only provide a short-term hedging facility, *swaps provide a long-term hedging facility which may not be available through other instruments*.

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