

INTEREST RATE SWAP

Understanding the concept of IRS is necessary before attempting to solve the problem. Swap means interchanging i.e. one series of payments are exchanged for another. A good reading about IRS in the study material is necessary to understand the theoretical concepts. Let us take the following example-

Consider 2 companies – AAA and BBB and their fund requirement:

		Cost of funds to AAA and BBB	
	Objective	Fixed Rate Bonds	Floating Rate Bonds
AAA	Floating	10%p.a	Libor+100 bp
BBB	Fixed	12%p.a	Libor+160 bp

Assume that now AAA wants to raise money on Floating Rate and BBB on Fixed Rate Basis. Design the swap based on sharing ratio of 80:40:20[A: B: Bank] is satisfied!

Answer – Lets tabulate the details

		Cost of funds to AAA and BBB	
	Objective	Fixed Rate Bonds	Floating Rate Bonds
AAA	Floating	10%p.a	Libor+100 bp
BBB	Fixed	12%p.a	Libor+160 bp
Differential		200 bps	60 bps

The figure 200 bps is $(12\% - 10\%) * 100$ bps (i.e. 1% = 100 bps) and 60 bps is $(160 - 100)$ bps – Actually it is Libor + 1% and Libor +1.6% respectively) (Ignore the sign change of 100 – 160). It can be seen that the advantage of 200 basis points (bps) of AAA and 60 bps of BBB can be exploited by both the parties. The Difference being 140 bps (i.e. $200 - 60$ bps) is known as Quality Spread Differential (QSD). Both parties can share the above difference and reduce their borrowing cost. The swap can be designed as follows:

Step 1) Identify the QSD. i.e. 140 bps – share it in 80:40:20 – we have 80bps for AAA, 40 bps for BBB and 20 bps for bank

2) Find out the effective cost –Since AAA needs floating rate – Effective cost = AAA's floating rate – Savings on swap = $\text{Libor} + 100 \text{ bps} - 80 \text{ bps} = \text{Libor} + 20 \text{ bps}$

Since BBB needs Fixed rate – Effective cost = BBB's Fixed rate – Savings = $12\% - 40 \text{ bps}$ (40 bps is .4%) so cost is 11.6%

See with just two steps the problem is solved. Sometimes the problem may not mention details reg. bank's share or swap % to be shared. In such cases share the QSD equally between both the firms. Also in some problems the instead of giving Loan %, it may be currency swaps, however the concept remains the same – work out the QSD. Share it and find out effective rate.

There is another type of problem regarding finding out First Fixed rate and Floating Rate payment i.e. Generic swap problems. The convention in swap market is to quote the Fixed Interest Payment as ALL IN COST (AIC) which means Fixed Interest rate is quoted relative to a Flat Floating rate Index. Formula for

calculating Fixed Rate payment (say semiannual) is **$(N)(AIC)(180/360)$** where N denotes notional principal amount. If its Floating Rate – formula is **$(N)(LIBOR)(dt/360)$** :

To illustrate – Suppose a dealer quotes an AIC for a generic swap at 10% against a 6 month LIBOR flat. If the notional principal amount is \$ 1 million, then the semiannual fixed payment would be –

$$(\$ 1,000,000) * (0.10) * (180/360) = \$ 50,000$$

Suppose the 6 month period from the effective date of swap to the first payment date (sometimes referred to as settlement date) comprises 181 days and that the corresponding LIBOR was 8% on the swap's effective date. First floating Rate Payment = **$(\$ 1,000,000) * (0.08) * (181/360) = \$ 40,222.22$**

Often a swap agreement will call for only the net amount to be settled. Here the fixed rate payer would pay to the floating rate payer a net amount of **$\$ 50,000 - \$ 40,222.22 = \$ 9,777.78$**

For reference – Frank. J. Fabozzi – Hand book on Fixed Income Securities – download the e book version. In it, it's given in length – concept of IRS