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Interest Rate Swaps: A Tool for Working Capital Management

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Swaps are here to stay as a fruitful combination of swaps with other fixed rate debt serves the firm's long and short-term interest. In this paper, Abhijit Dutta shows how a firm's current asset and liability positions can be changed by the use of Plain Vanilla Swaps.

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In plain and simple terms, working capital is the excess of current asset over current liability. But, there must be some catch in it. Since the balance sheet proposition spells out that all long-term funds should finance all long-term assets and all short-term funds should finance all short-term assets, there should not be any surplus left. Therefore, the simple definition of working capital gives out the signal that funds from short-term liability have gone into long-term assets or vice versa and, long-term liability has been converted into shorter maturity period.

Per se, the problem will not surface unless a time comes to adjust the fixed rate charges on either of the sources of fund. A firm can handle such a situation by refunding its present liability position and by creating a new liability having desirable characteristics. Say, for example, a long-term loan of 15 years from a bank with quarterly interest payments is the firm's original arrangement. The idea is to now refinance such a loan. The strategy may be to issue a 90 days Commercial Paper in the capital market on an ongoing process of 15 years depending upon the need of the firm.

As a consequence, the cost of the firm does not remain fixed but varies quarterly with the interest of the Commercial Papers. This may turn out to be an advantage to the firm only if the float (not fixed) cost remains below the fixed cost. Float cost has, however, every chance of being more, because it involves:

* Prepayment penalties on the original bank loan arrangement.

* Placement fee for the Commercial Paper (60 placements, quarterly for 15 years in this case).

Hence, managing the interest (fixed charges — either as a float cost or a fixed cost) becomes the crux of the problem.

Objective of the Paper

As interest management in terms of float cost and fixed cost becomes a problem, a way has to be thought of so as to handle and adjust the exposure of the firm's asset and liability positions in accordance with the changing market conditions. The present paper outlines how interest rate swaps can be used to handle such situations.

The Concept of Interest Rate Swaps

Interest rate swaps (IRS) are basically accepted as interest rate and risk management instruments to adjust the exposure of the firm's asset and liability position in accordance with the change in the market condition.

Basically, IRS is an agreement between two parties, generally a firm and a financial institution, to exchange cash flows on a periodic basis for a specified time duration.

A simple IRS called a 'Plain Vanilla Swap' enables the participants (called the counterparty) to make its payments based on a fixed rate of interest that does not change throughout the life of the agreement. Thereafter, the level of the other counterparty's[1] requirement in terms of payment is restructured to vary with the movements of interest rate index that generally changes over time. Different indices are used to serve the guideline. By far, the most commonly used index is the LIBOR.[2]

Let us take a hypothetical work out for the understanding of the concept. Assume that there are two counterparties X and Y. The terms they have agreed upon are as follows:

Date of initiation - June 5, 1991

Date of maturity - June 5, 1996

Principal (Notional) - US $ 20 million

Fixed rate - 9.50 %

Fixed rates receiver - counterparty Y

Float rate - 6 months LIBOR

Settlement dates - June 5 and December 5 of each year

LIBOR - Determined in advance, paid in arrears.

The last column of Table 1 shows the net swap receipt and payments. Counterparty X receives the net settlement whenever the bond basis adjust level of LIBOR is less than 9.50 per cent.

Swap Pricing Convention

It is essential to clarify the terms used in swap market before pricing can be understood.

If two parties A and B enter into swap in the form that A party pays fixed and B party receives fixed, then A will be designated as 'bought' the swap (taken the

1 Parties entering into a swap contract are called counterparties.

2 LIBOR stands for London inter-bank offer rate.

Table 1 : Swap Cash Flows For Counterparty X's Perception

Settlement Date	No.of Days	LIBOR (%)	Fixed* Rate $	Float Rate $	Counterparty X's Net Payment
5.06.91	-	8.26	-	-	-
5.12.91	183	8.40	965,833	854,000	1,11,833
5.06.92	183	8.75	965,833	889,583	76,250
5.12.92	183	9.00	965,833	915,000	50,833
5.06.93	182	9.25	960,555	960,555	0
5.12.93	183	9.50	965,833	965,833	0
5.06.94	182	9.75	960,555	985,833	(25,278)
5.12.94	183	9.80	965,833	996,333	(30,500)
5.06.95	182	9.25	960,555	935,277	25,278
5.12.95	183	9.25	960,555	935,277	25,278
5.12.95	183	9.00	965,833	915,000	50,833
5.06.96	183	-	-	-	-

Notes:

1. Fixed rate has been calculated by using the following equation:

$$9.50 \times \frac{\text{No. of days}}{360} \times 20$$

2. Float rate has been calculated by using the following equation:

$$\text{LIBOR} \times \frac{\text{No. of days}}{360} \times 20$$

3. Counterparty X's net payment is calculated by finding the difference between the previous columns.

4. All the calculations are done on the notional capital simply to determine the scale of transaction and not actually exchanged between the counterparties.

long-term position) and B as 'sold' or 'short' the swap. Generally, counterparty B will be viewed as having contracted to 'sell' LIBOR on each settlement date for a specific price. Here, LIBOR is the 'commodity' traded and the fixed rate is its 'price.' Counterparty B will 'buy' LIBOR on each settlement date at fixed rate.

The fixed rate side of the swap is quoted in two separate components: i. The treasury bond yield; ii. A credit spread. Since the value of the swap is affected if either of the two counterparties defaults, treasury bond yield serves as a proxy or dummy for the return on riskless security.

Thus, when fixed rate is determined in a swap, it is not determined on the absolute level, but on the increment over the risk free yield. The default risk premium is called 'swap spread.' Here :

Fixed Rate = Treasury Bond Yield + Swap Spread

Float Rate Index = 6 Month LIBOR

Counterparty A ←————————————————→ Counterparty B

Swap Fixed Rate = Total Bond Yield + Swap Spread

How to Manage Working Capital with Swap?

Since swaps are considered as interest hedging devices, a company can effectively hedge the risk exposure of its assets and liability position to change market condition by using swap.
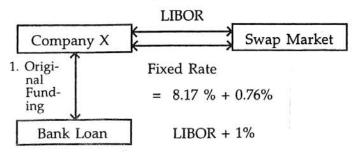
Let us consider an illustration. Suppose 2 years ago, company X negotiated a 5-year bank loan. This required six monthly payments based on a floating rate index of 6 months LIBOR + 1 per cent. We further assume that when the firm incurred this obligation, its net revenue was closely tied to fluctuations in short-term interest rates. Now, with a change in the firm's assets, revenues are expected to be roughly constant in normal terms over the next few years. The situation will create a mismatch in the risk as there are now different degrees of interest rate sensitivity on the asset side of the balance sheet than on the liability side. Under this situation, company X is clearly exposed to risk that interest rates will increase thereby raising the interest expenses of the bank loan without any compensating rise in revenues.

Table 2: Representative Swap Market Quotes

Swap Markets	Treasury Yield(%)	Bid Swap Spread	Ask Swap Spread	Effective Fixed Rate (%)
2 Yrs	7.98	67	74	8.65 - 8.72
3 Yrs	8.17	72	76	8.89 - 8.93
4 Yrs	8.38	69	74	9.07 - 9.12
5 Yrs	8.50	70	76	9.20 - 9.26
7 Yrs	8.75	71	77	9.46 - 9.52
10 Yrs	8.94	73	79	9.67 - 9.73

Using values from Table 2, we can redraw the picture of company X.

Swap Transaction

LIBOR

| Company X | ←————→ | Swap Market |

1. Original Funding

| Bank Loan |

Fixed Rate = 8.17 % + 0.76%

LIBOR + 1%

The two ways that company X can protect itself from rising interest rates are :

* Issuing a new 3-year fixed rate debt obligation in an amount sufficient to pay off the remaining portions of the existing loan.

* Combining the bank loan with a 3-year pay fixed interest swap having semi-annual settlement date, timed to match the loan's interest payment dates.

The second solution is preferable for the following reasons:

* The first solution may require additional cost of underwriting and transaction fees.

* There may be penalties associated with the refinancing of the loan in the first case.

* Interest rate swaps can be reversed almost as easily as they can be implemented and, consequently, they can be thought of as a more flexible solution to a risk management problem that may be temporary.

Coming back to company X's situation, we reach at the following figures as effective annual financing cost (over 365 day bond basis)

1. Bond coupon payment : (LIBOR + 1%) (365/360)

$$= (LIBOR) (365/360) + 1.014\%$$

2. Swap transaction:

(a) Payment = 8.93%

(b) Receipt = (LIBOR) (365/360)

Net cost of fund = 8.93% + 1.014 = 9.944%

This synthetic fixed rate for company X at 9.944 per cent is not directly comparable with the fixed rate that company X would have obtained via direct loan-refunding scheme, as it involves credit exposure to the swap counterparty.

Thus, we see that, swap agreement was used to alter the interest rate sensitivity of a firm's liability structure. This was illustrated on a Plain Vanilla Swap. There exists more elaborate swap structures such as:

* Basic Swap in which both rates are floating.

* Currency Swaps in which the ratios are denominated in different currencies.

* An Amortizing Swap that has a notional principal that declines over the life of the agreement.

* Off Market or Non Bar Swaps in which one party makes an initial payment to the other.

* A Forward Swap that moves the start date of the agreement into the future.

Conclusion

Plain Vanilla Swaps are amongst the most important innovations in risk management field in the present era. The swap market has grown extraordinarily in all dimensions. It has found its place of honour in defensive hedging strategies to that of aggressive speculations.

The present paper shows how a firm's current asset and liability positions can be transformed by the use of Plain Vanilla Swaps. The advantage of such a swap arrangement is that the firm is able to generate the desired pattern of cash flows without disturbing the balance sheet.

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