

### Interest Rate Swaps

A problem with FRA is that they become difficult to manage if a company wishes to hedge a succession of interest payments for more than a couple of years. An interest rate swap can offer interest rate protection in one contract rather than a whole series of contracts. Any swap is basically an agreement between two parties, generally referred to as counter-parties, to swap future cash flows in relation to a specified contract at the outset of the agreement. An interest rate swap consists of the exchange between two counter-parties of fixed rate interest for floating rate interest in the same currency calculated by reference to a mutually agreed notional principal amount. This principal amount, which would normally equate to the underlying assets or liabilities being "swapped" by the counter-parties, is applicable solely for the calculation of the interest to be exchanged under the swap. At no time is it physically passed between the counter-parties. The interest rate swap is usually conducted through an intermediary like a bank, acting as a market maker through which the payments flow.

In interest rate swap transactions, only payments representing or corresponding to the interest payments on the notional loan amount are exchanged. The principal amount is not. This has important implications on the credit risk of the company. One party pays floating rate, the other pays fixed rate. Typical floating indices are LIBOR, prime rate and Treasury Bill rates. Most of the swaps (75%) in dollars are based on LIBOR. The swap has a specific notional amount and maturity.

There are essentially two groups active in the swap market - end users and intermediaries (or dealers). The end user can be defined as any party which undertakes a swap agreement to change its interest rate exposure for economic or financial reasons. In most cases swap agreements will be made through banks, i.e. Terrey's would not know Chocolate was its swap counterparty. These banks not only identify counterparties but also act as principal to both parties which stands between the fixed-and-floating-rate funds providers. The bank may not necessarily find a counterparty for the transaction - it may choose to take on the position itself into a traded swaps portfolio - known as warehousing. The bank charges a fee but it will assume the credit risk of one of the parties defaulting (i.e. not paying their interest payment). The intermediary's legal position is that it deals as principal but functionally tends to be seen, and to itself, as a guarantor or a conduit for payments isolating credit judgements and preserving confidentiality.

A legal agreement will be drawn up between the intermediary bank and each of the counterparties. Terms included on the swap agreement would include the following, but most participating markets now use standard contract terms drawn up by the International Swaps Dealers Association (ISDA):

- Notional amounts
- Term
- Names of the parties
- Details of fixed-rate parties
- Details of floating-rate parties
- Payment dates
- Frequency of interest payments
- Interest rate and days basis for interest calculations
- Reference banks

- Early termination clauses

### Growth of Interest Rate Swaps

The growth in the interest rate swap market has been spectacular.

The maturities on interest rate swaps are commonly available from one to ten years although they can be arranged for longer periods. Short term maturities have been available since 1986 based on short term money instruments. Most activity occurs in the period up to three years, but because of the size of Eurobond related deals the money weighted average is about four years. (The average maturity of interest rate swaps which involve an end-user is 4.5 years).

### Reasons for Use

There are a wide range of end users of the swap market. Banks, companies, building societies, governments, etc. are all participants for many different reasons. Swaps are today one of the most important and flexible tools used by the treasurer. However, the reasons for this remarkable growth are varied. A recent academic paper considered empirical evidence on the characteristics of companies which use interest rate swaps and concluded that;

*"... no single explanation of swaps is capable of explaining the behaviour of all swap users".*

We can break the rationale down into three main areas:

- Interest rate management
- Utilizing the varying abilities of companies to access different capital markets
- Speculation

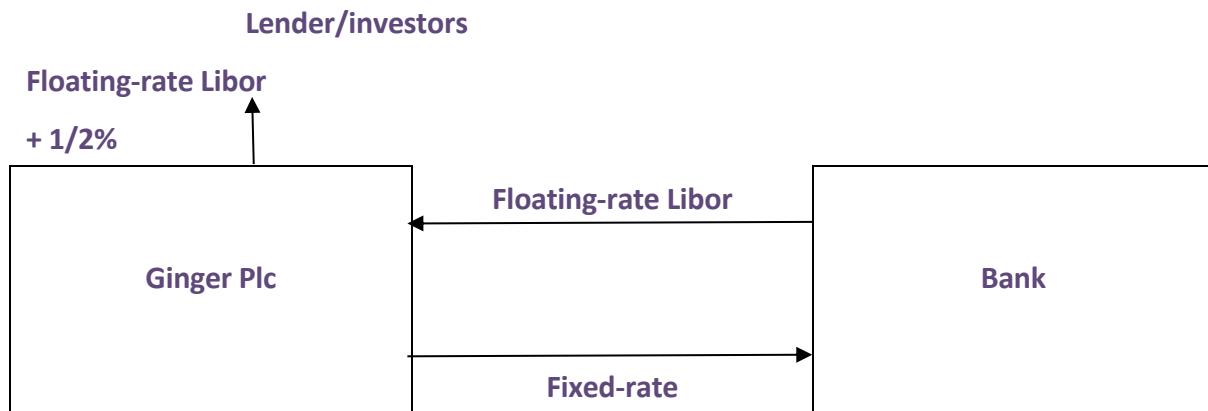
1. Interest rate management

Interest rate swaps allow the company to:

- restructure a debt portfolio without raising new, perhaps unnecessary, finance. This provides much greater room for manoeuvre in the treatment of existing debt;
- convert floating rate deposits to fixed rate when the expectation is for interest rates to decline. The reverse can also be produced; and
- match the cash flows on their assets to their liabilities as demonstrated with Terrys and Chocolate Plc.

### Example – Interest Rate Swaps

Ginger Plc has a floating rate loan on which it pays LIBOR + 1/2%. If it expects interest rates to rise it can engage in a fixed/floating interest rate swap with a swap counterparty whereby it will pay fixed and receive floating. This will leave Ginger with a fixed rate payment and therefore protection against rising interest rates as demonstrated in the diagram below;



The interest rate swap is not only a financing technique connected with the issue of some debt; it is also relevant for companies wishing to change the terms on their existing debt. Just as there has been a general increase in corporations hedging activities there has been a general increase in the use of interest rate swaps. While it is true that instruments such as futures, options and forward contracts may be used for the same purposes, the flexibility and efficiency of interest rate swaps allow companies to construct their own funding Framework with an exact blend of fixed and floating interest rates and long and short term maturities. Furthermore, swaps have been agreed for periods of as much as 30 years into the future and hence provide scope for hedging over much longer periods than the standardised maturities of futures, options and FRA. Long term interest rate swaps may have been used to provide liquidity in the market for long dated forward agreements, which was historically very illiquid. In addition, swaps are being combined with other instruments to produce new synthetic instruments.

#### *Self Assessment Question 1*

Draw a swap diagram, illustrating the cash flows of the following company, Eden Plc, which has a fixed rate bond but expects an interest rate fall and, thus engages in floating to fixed interest rate swap.



2. Utilising the varying abilities of companies to access different capital markets. Some of the reasons behind the appearance of a swap market arise from the underlying market inefficiencies among the different parts of the capital market, so it is sometimes possible to establish better funding terms than are otherwise obtainable. The incentive to use interest rate swaps is due to capital market imperfections and comparative advantage among different borrowers in these markets:

*"Interest rate swap transactions are based upon a simple economic principle of comparative advantage".*

An individual borrower might have tapped a certain market segment extensively, and might therefore have caused the terms of credit provided by this particular debt instrument to deteriorate. Another borrower which has not yet tapped this specific debt market might be able to obtain better terms than the first borrower. The first borrower might in turn obtain credit from another, more favourable debt market segment and swap the debt servicing obligations with the second borrower. Both counter-parties will then receive a net gain from the swap transaction. Also the interest rate swap allows the company to access fixed rate funding without tapping its traditional sources of capital and thereby saving those sources for future use.

It was argued that pricing is inconsistent across credit markets for fixed and variable rate borrowing, mainly due to the different ratings companies receive on their riskiness. Interest rate disparities may exist across national boundaries. For example, short term floating rates are often lower in the US than in the European markets, while fixed rates on Eurobonds may be lower than US bond rates. Eurobond financing is difficult without name recognition in that market. Therefore, there may be opportunities for a swap between a US corporation seeking fixed rate Eurobond funds and a Eurobank seeking short term financing. Different national tax, accountancy and regulatory arrangements may provide swap opportunities between countries. It has been estimated that almost half of the recent swap volume can be attributed to arbitrage opportunities.

Therefore, arbitrage opportunities exist to exploit, via the use of an interest rate swap the quality spread differential. A quality spread is the premium that a borrower with a low credit rating has to pay over a borrower with a high credit rating. This idea was used as a selling point of interest rate swaps and according to the popular press, drove a substantial volume of transactions in the early days, particularly in the US domestic markets. The Governor of the Bank of England, stated in 1987 that swaps enable borrowers to "*arbitrage*" the credit markets, allowing;

*"... a good credit rating in one part of a currency/maturity matrix to be translated into relatively cheap borrowing in another"*

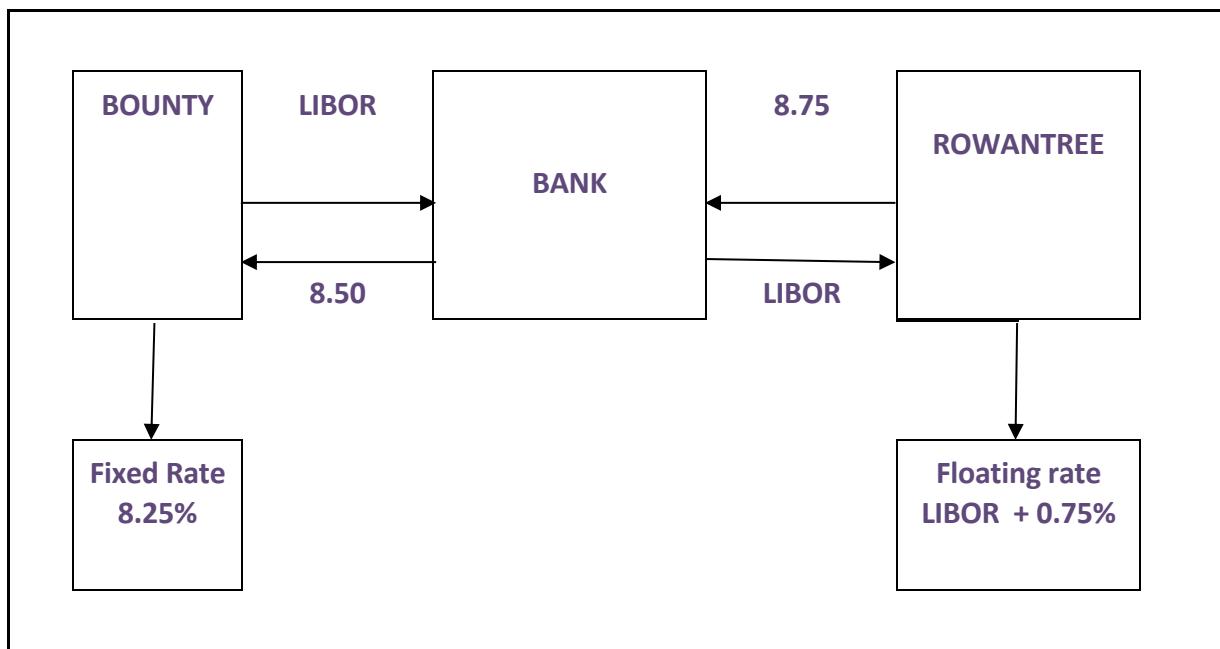
The arbitrage of quality spread differentials as an explanation of the existence of interest rate swaps was promptly rejected by many academics as a long run explanation as the very process of utilising the opportunity would eliminate it. Thus arbitrage would be driven by finite processes and should lead to declining swap volumes rather than the substantial increases observed. Although arbitrage opportunities drove the early swap transactions, it has been conceded that:

*"Today, however, opportunities tend to be less clear cut, as arbitrages have been eroded by frequent use, and as banks increasingly take on unmatched positions rather than intermediating swaps between borrowers. Transactions are as a result less transparent"*

Example 2 - The classic interest rate swap example below illustrates this argument. Two companies have access to fixed and floating rate funding at the following rates.

	Bounty	Rowantree
Fixed Rate Funds	8.25%	10.0%
Floating Rate Funds	LIBOR + 0.25%	LIBOR + 0.75%

Bounty wishes to issue floating rate funds and Rowantree requires fixed rate funding. Although Bounty can issue fixed and floating debt more cheaply than Rowantree, it has a comparative advantage issuing fixed rate funds. Therefore, a swap opportunity exists whereby both companies can reduce their cost of borrowing. The swap terms are given by the market making bank as LIBOR flat i.e. pay and receive LIBOR in the swap and on the fixed side the bank will pay 8.50% against the receipt of 8.75%. This is shown in the following diagram below:



Bounty	Rowantree
<u>On Loan</u>	<u>On Loan</u>
Pays Fixed Rate	8.25%
<u>Under Swap Agreement</u>	<u>Under Swap Agreement</u>
Pays Floating	LIBOR
Receives Fixed 8.50%	Receives Floating
Net Cost	Net Cost
<b>Gain 0.5%</b>	<b>8.75%</b>
	<b>LIBOR</b>
	<b>9.5%</b>
	<b>Gain 0.5%</b>

The bank will gain **0.25%** in its role as intermediary.

It is important at this stage to consider how swaps are quoted. By convention, in a fixed floating interest rate swap, the floating rate payment stream is Libor flat, the spread attaching itself to the fixed payment stream i.e. Government Gilts 90/140 or the semi-annual Treasury yield of the currency in question. A look at the Reuters screen swap for UK sterling swaps will show a typical view of the swap market:

## UK STERLING SWAPS QUOTED ON GILTS

	Treasury spreads
2yrs	Gilt + 87-80
3yrs	Gilt + 75-70
4yrs	Gilt + 70-66
5yrs	Gilt + 67-60
7yrs	Gilt + 66-60
10yrs	Gilt + 62-57

The left hand column shows the maturity of the Swap, hence a bid/offer quotation on the 5-year swap of 60/67 indicates that six-month Libor payments are received against payment of the relevant Government Gilt plus 60 basis points, and that six-month Libor payments are made against receipt of interest payments at the Gilt yield plus 67 basis points. The dealer's maximum profit is partly represented by the spread of seven basis points, plus a spread on the underlying Gilt.



A swap is sold to a buyer who pays the offered rate of 67 over Gilts. This actually means that:

The BUYER of a swap PAYS the FIXED rate.

The SELLER of the Swap RECEIVES the Fixed rate.

(One way to remember this is that the buyer of anything from a market maker always pays the higher price, the swap is no exception).

If we want a five-year sterling swap we will consider the UK Government Bond with five years to run, which we will use to price the swap. This is currently yielding 9.05% p.a. By adding the spread of 0.67% (67 basis points) we can sell a swap at a rate of 9.72% and buy a swap for 9.65%. However, these rates need to be adjusted to meet certain standard market practices and to make sure you are comparing like with like (the basis trap). We will consider this later.

***Self Assessment Question 2***

The arbitrage which underpinned the initial development of the interest rate swap lay in the differential pricing of credit risk between the fixed market and the banking market. This is illustrated below:

Rating Borrower	Fixed Interest Pricing	Bank Loan Pricing
AAA	Gilts + 0.75%	LIBOR + 0.15%
AA	Gilts + 1.00%	LIBOR + 0.20%
A	Gilts + 1.50%	LIBOR + 0.27%
BBB	Gilts + 2.00%	LIBOR + 0.40%

Arrange an interest rate swap between a company with a rating AAA and a company with a rating BBB under which each would achieve the lowest cost financing. The swap spread is Gilts 90/140 against LIBOR. The yield on a five-year gilt is currently 7.5% and company with a rating AAA wants a floating rate exposure while the company with the rating BBB wants a fixed rate liability. Draw the swap diagram.

### 3. Speculation

Interest rate swaps may be used to take a position on interest rates although many corporate treasurers would deny they used interest rate swaps for this purpose.

#### **Advantages of Swaps**

The advantages of a swap to a borrower have obviously been mentioned in the reasons for the growth in the swap market. However, they also include:

- overall interest costs are known exactly in advance; and
- there is no up-front premium.

#### **Disadvantages of Swaps**

The disadvantages of a swap to a borrower are:

- how closely the amount hedged matches the amount of risk.
- there is usually an immediate increase in the cost of funds (assuming a positive yield curve);
- there is an opportunity loss if rates stay the same or fall; and
- a bank treats a swap as a credit risk. This may therefore reduce its ability to conclude other transactions with the borrower.