Communiqué

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Swaps for Pension Schemes: The Details

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Following on from our Communiqué article 'Introduction to Swaps for Pension Schemes' we now provide details of the ins and outs of swaps contracts and the risks associated with their use. We look at the contract details of inflation swaps first, followed by interest rate swaps. Finally we touch on some of the risks associated with swaps and how these risks can be mitigated.

Inflation Swaps

Here we delve into the contract details of inflation swaps and Retail Price Index (RPI) swaps in particular.

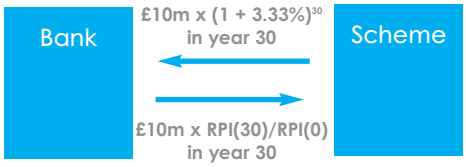
Inflation swaps are typically quoted as shown in the table below:

Tenor (yrs)	Offer Rate %	Mid Rate %
1	3.17	3.16
2	3.06	3.05
3	3.05	3.04
4	3.05	3.04
5	3.07	3.06
10	3.19	3.18
15	3.27	3.26
20	3.33	3.32
25	3.33	3.32
30	3.33	3.32
35	3.33	3.32
40	3.31	3.30
45	3.29	3.28
50	3.25	3.24

What does the 30 year offer rate of 3.33% mean? Let's assume that we fix a contract size (the "notional amount") of, say, £10m. Then the quoted offer rate means that a bank will pay £10m uplifted with RPI between now and year 30. In return the pension scheme has to pay £10m uplifted by a compound fixed rate of 3.33% in year 30 as shown below (Fig 1).

To be precise, in a standard market quote RPI(0) will be the published level of the RPI Index two months prior to the swap start date and RPI(30) will be the published level of the RPI Index two months prior to the swap end date in 30 years' time. At the outset the cashflows from the swap will be as in the top chart on page 2 (Fig 2). The swap has zero value at the start (ignoring bid-offer spreads) so the projected cashflow for the fixed side and the inflation-linked side is the same.

Fig 1



If we put many of these zero-coupon swaps alongside each other, perhaps with different notional amounts, then we can build cashflows from inflation swaps that look like inflation-linked pension liability cashflows (see the bottom chart of Fig 2).

We have talked about RPI swaps here. Limited Price Index (LPI) swaps are similar except that the inflation uplift can be tailored to match the uplift in LPI-linked pensions in payment.

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Fig 3

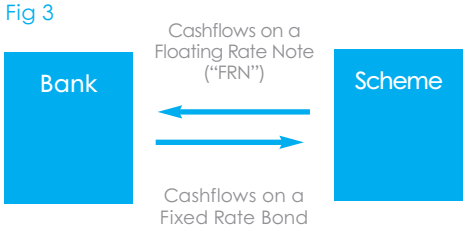
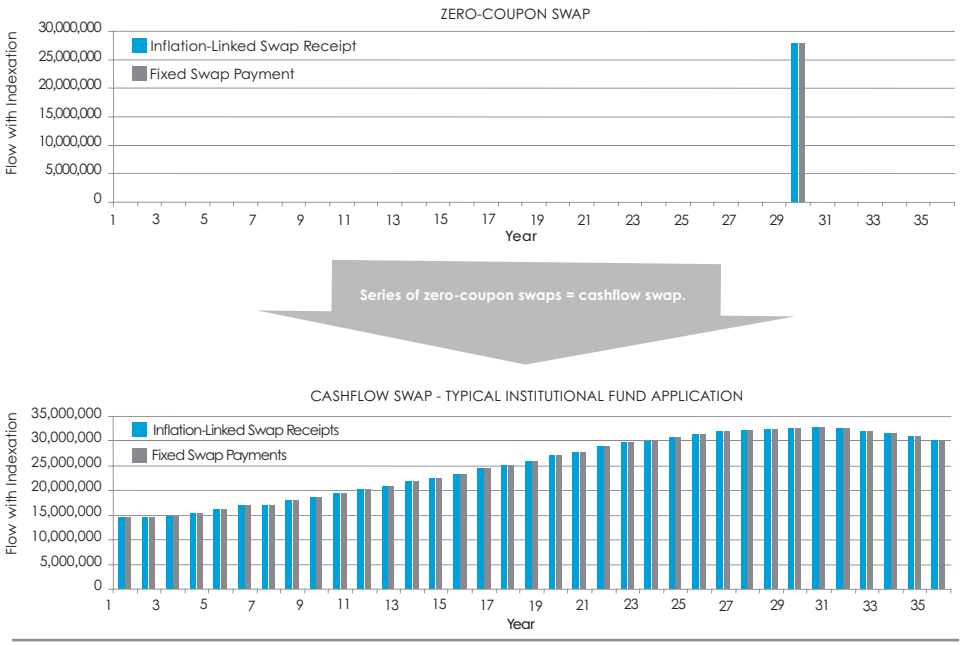


Fig 2



Interest Rate Swaps

A standard interest rate swap is known as a par interest rate swap. It involves exchanging all the cashflows on a fixed rate bond for all the cashflows on a floating rate note (i.e. a bond that pays coupons based on 6-month LIBOR). The coupons on both bonds are usually paid semi-annually in the sterling market. At the outset the fixed rate is set so that the value of the fixed rate bond equals the value of the floating rate note (FRN).

The value of an FRN has very little sensitivity to interest rates; when rates go down its coupons go down to compensate. On the other hand the value of a fixed rate bond is sensitive to interest rates; when rates go down its value goes up. So an interest rate swap is a good way for a pension scheme to artificially increase the interest rate sensitivity of its assets to match that of its liabilities. It can do this without disturbing the underlying asset portfolio.

"Zero-coupon" interest rate swaps have been popular with pension schemes. Most pension schemes do not need or want a semi-annual exchange of coupons on their interest rate swaps. Therefore, on both sides of the par interest rate swap above, interest is accumulated at a compound rate and exchanged at maturity.

An alternative way of avoiding the regular exchange of coupons is to enter "forward-starting interest rate swaps". We could agree a rate today for a 20 year fixed rate bond for which a scheme will start receiving cashflows in 5 years' time and finish receiving cashflows in 25 years' time. In return the scheme would pay floating rate note cashflows over the same period. This is just like entering a standard 25-year interest rate swap today where the scheme **receives** fixed and at the same time entering into a standard 5 year interest rate swap where the scheme **pays** fixed. For the right choice of fixed rate the first five years of cashflows all cancel out.

Risks and Risk Mitigation

Credit risk

If we take the example of an RPI swap for a pension scheme, at the outset the swap value is, roughly, zero. The swap will become more valuable to the pension scheme if we experience high inflation over time and if the market's view of the future rate of inflation increases. The pension scheme will then have counterparty credit exposure to its counterparty bank. That is the scheme is at risk of the bank defaulting. In this case the bank could provide collateral in the form of bonds to the scheme to mitigate this risk of default. Similarly the bank will be concerned about the default risk of the scheme if inflation falls so that the swap has positive value to it. In this case the scheme could pay collateral to the bank. Two-way collateral agreements are standard for swaps between pension schemes and banks. This collateralisation process substantially reduces the risk of a bank defaulting. It does not however remove the risk of some loss altogether.

Market risk

If inflation falls the swap will have negative value to the scheme. However this should coincide with a fall in value of the scheme's inflation-linked liabilities. The risk here is that the terms of the inflation swap do not match the precise terms of the pension liabilities. In particular if there is a period of negative inflation, an RPI swap will fall in value by more than the value of LPI-linked liabilities.

Final Thoughts

The variety of swaps and their uses has filled many books; we hope that this note gives a brief but useful overview of the relevant details.

There are other potential costs and considerations that we would be happy to explain. Please contact your account manager with any queries.