Information on interest rate swaps and swaptions

This fact sheet contains general information on interest rate swaps traded through Danske Bank.

Interest rate swaps and swaptions may be traded in an OTC transaction with Danske Bank as the counterparty.

What are interest rate swaps?
An interest rate swap is an agreement between two parties to swap interest payments in the same currency.

These are some of the ways an interest rate swap can be used:

- to pay a fixed rate of interest and receive a floating rate of interest;
- to receive a fixed rate of interest and pay a floating rate of interest;
- to pay a fixed rate of interest and receive a different fixed rate of interest; or
- to pay a floating rate of interest and receive a different floating rate of interest.

When setting up an interest rate swap, you determine the effective date, the termination date, the principal, including any settlement profile, and the payment frequency of interest swaps.

The fixed rate of an interest rate swap reflects the market rate for the selected term while the floating rate is determined relative to a reference rate, which for Danish kroner is CIBOR.

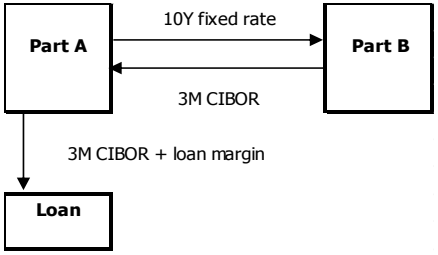
Interest payments may be agreed that do not correspond to the interest rate level at the time the transaction is set up. This would then be offset by an upfront payment at the time the transaction is set up by the party in whose favour the rates have been fixed.

The principal amounts are not swapped when the transaction is set up but will represent the calculation base. Only the net interest amounts will be swapped during the term of the contract.

Using interest rate swaps
Here are two examples of how interest rate swaps can be used.

Changing interest payments on loans
The interest rate swap can be used to change interest payments on a loan. That way, physical debt rescheduling can be avoided.
In the example, Part A has raised a loan with a maturity of ten years. The interest rate is floating and fixed every three months. Part A has a single interest payment every three months equal to the CIBOR rate plus a loan margin.

When entering into the interest rate swap, the parties agree on a quarterly payment of a fixed interest for ten years to B. By way of consideration, B pays the CIBOR rate enabling A to lock in the rate of the loan when the interest rate swap is set up. Hence, the net interest payment for the following ten years will consist of the fixed rate plus the loan margin.



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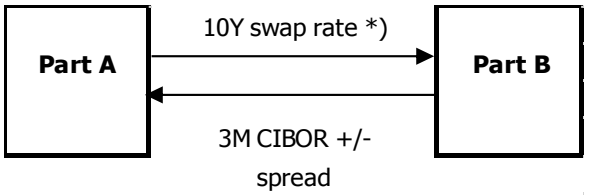
Exploiting specific expectations to developments in short and long-term interest rates

In situations where interest rates increase with the maturity, we speak of a normal yield curve.

If you expect long-term rates to decline relative to short-term rates, an interest rate swap may be constructed as shown below.



*) A pays the 10-year swap rate as determined every third month. The term of the contract could be five years, for example.

As interest rates increase with the maturity at the time the contract is entered into, there will be a positive interest premium/discount (spread) indicated relative to the floating reference rate. Alternatively, the spread may be calculated as a deduction (discount) relative to the 10-year swap rate.

A flexible instrument

An interest rate swap may be adjusted to suit individual needs. Examples of parameters that can be agreed at the establishment of the transaction include:

- the day-count convention for the fixed interest rate;
  The day-count convention determines the payment resulting from the price fixed by the parties. In other words, there is a difference between calculating the payment on the basis of a 360-day interest year and calculating it using the actual number of days in the calendar year.

- the frequency for determining the floating rate and whether interest should be paid in advance or in arrears;

- the frequency for payment of the floating and the fixed rate;

- the settlement profile.
  This may be a so-called bullet profile, for which the principal is not written down during the term of the contract. An alternative is a serial profile, for which the principal is written down by equal amounts during the term.
  The settlement profile may also be fixed individually so that the principal of the interest rate swap increases initially and then declines.

Pricing interest rate swaps

The basic principle of determining the price of interest rate swaps is that the values of the two cash flows (with the addition of a possible upfront payment) should be identical so the contract has no market value when it is set up.

Of course, the floating rate is not known during the term of the interest rate swap, but using the structure of the yield curve at the time the transaction is set up, you can estimate how the floating rate will develop.

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The fixed rate is then determined as an average rate (effective yield) relative to the expected development in the floating rate. The rate is fixed so the present values of the two cash flows are identical.

After the floating and fixed rates have been fixed, a client margin is added to the transaction, which results in a negative market value at the time the transaction is entered into, corresponding to the present value of the client margin during the entire term of the transaction.

Term
The term of an interest rate swap varies from one currency to another, but is typically up to 30 years.

If a transaction is terminated prior its scheduled maturity, the market value may be negative. The party to whom the transaction has a negative market value must compensate the other party by an amount equal to the absolute value of the negative market value.

Risk factors
Under the executive order on risk-labelling of investment products, this product type is in the "RED" category.
The "Red" category consists of: "Investment products involving a risk of losing more than the amount invested, or product types which are difficult to understand.
The risk-labelling categories defined by the Danish Financial Supervisory Authority ("DFSA") can be found at www.danskebank.dk/risikomaerkning [(in Danish only)].
The risk-labelling system should not form the exclusive decision-making basis of an investment. It is only intended as a supplement to the information you should obtain before making an investment or to the advice you receive from the bank after defining your investment profile.

The risk of an interest rate swap relates to the future development in short and long-term interest rates.

The greatest risk for a payer of fixed interest in an interest rate swap is a general decline in short and long-term interest rates, as it would increase the present value of the future payment obligation. The opposite applies if interest rates go up.

In the example of a swap of a floating 3-month rate and a floating 10-year rate, such contract would not be notably sensitive to a general increase or decline in interest rates.
The greatest risk relates to long-term interest rates increasing by relatively more than short-term rates. This type of contract is much more sensitive to changes in the slope and bend of the yield curve than to parallel shifts.

What is a swaption?
A swaption is an option for an interest rate swap.

When you buy a swaption, you also buy the right to enter into an interest rate swap on pre-specified terms and conditions. When exercising the swaption, you obtain the right to pay or receive a fixed rate of interest in an

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interest rate swap that enters into force at an agreed date. As a buyer, you must pay a premium to the seller when entering the contract.

Types of swaptions
A payer swaption is an option to enter into a swap, paying a fixed rate of interest.

Conversely, a receiver swaption is an option to receive a fixed rate of interest in an interest rate swap.

For European swaptions, the right to enter into the interest rate swap may only be exercised at one specified date, which is on the swaption expiry date.

American swaptions can be exercised at any time during the duration of the contract.

Bermuda swaptions is the third type of swaptions. It is a hybrid between European and American swaptions. Holders may exercise the swaptions on several predefined dates during the duration of the contract – e.g. every six months.

When entering into a swaption, you determine the effective date, the termination date, the principal, and any settlement profile, the payment frequency of interest swaps and the interest rate on the underlying swap.

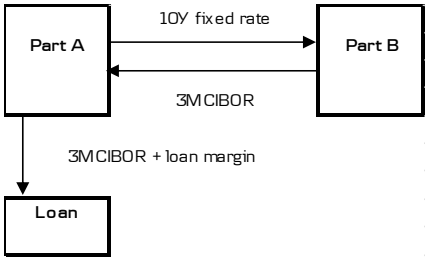
The expiry of the swaption will coincide with the effective date of the underlying swap. On expiry of the option, the swaption will be exercised by the buyer if the underlying swap has a positive market value.

The contract is swap-settled if the buyer enters into an interest rate swap on expiry of the option, and it is cash-settled if only the positive market value of the underlying swap is paid to the buyer of the swaption. In the latter case, the buyer does not enter into an interest rate swap.

Using swaptions
Here are two examples of how swaptions can be used.

Hedging against rising interest rates on floating rate loans
In the figure below, Part A has raised a loan in Danish kroner with a maturity of ten years. The interest rate is floating and fixed every three months. Part A has a single interest payment every three months equal to the CIBOR rate plus a loan margin.

Part A wishes to hedge against rising interest rates but would also like to benefit from the floating interest rate should interest rates fall.



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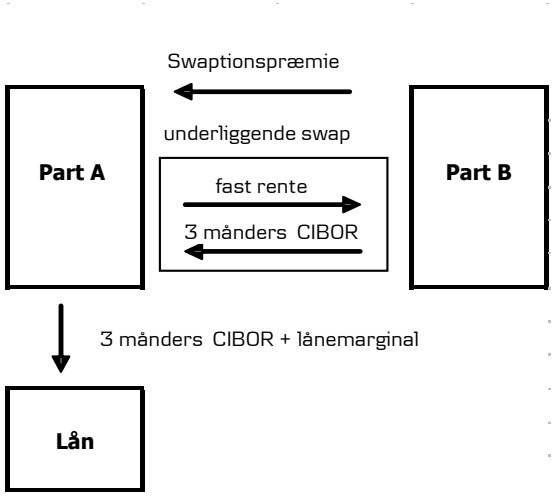
By buying a payer swaption, Part A can hedge the risk of rising interest rates. If interest rates go up, Part A may exercise the swaption and enter into the interest rate swap as a payer of a fixed interest rate. If interest rates fall, the swaption will not be exercised, and Part A maintains his floating rate funding.

Possibility of cheaper fixed rate funding of floating rate loans

If Part A wishes to enter into an interest rate swap by paying a fixed rate at a lower interest rate level than the current market rate, he may opt to sell a receiver swaption. The swaption has a strike price that is lower than the market rate at the date of the transaction.

In this situation, the seller has an obligation to pay a fixed rate of interest if interest rates fall to below the strike price and the buyer exercises the option. In return, Part A receives a premium which helps reduce the funding costs of the underlying loan.



converted into a fixed rate of interest via the interest rate swap. If interest rates go up, the swaption will not be exercised.

A flexible instrument

A swaption may be adjusted to suit individual needs. Examples of parameters that can be agreed at the establishment of the transaction include:

- the terms and conditions of the underlying swap such as payment frequency for floating and fixed rates, the principal that represents the calculation base, and any settlement profile and interest, day-count convention and the like (for more details, see the fact sheet on interest rate swaps)
- swaption term and type
- the strike price
- settlement (swap-settled or cash-settled contract)

Pricing swaptions

The price (premium) of a swaption is determined by the following factors:

- option type (”payer”, ”receiver”, ”American”, ”European”, ”Bermuda”).
  As mentioned earlier, European swaptions may only be exercised at one specified date, Bermuda swaptions at multiple specified

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dates and American options at any time during the term of the swaption. The more exercise dates a swaption has, the higher the premium. Consequently, American swaptions are more expensive than Bermuda swaptions, which in turn are more expensive than European swaptions.

- the market price of the underlying swap (the market price equals the fixed interest rate of an interest rate swap that takes effect when the swaption expires);

- the term of the underlying swap.
  The term of the underlying swap varies from one currency the next, but is typically up to 30 years.

- the strike price
  The difference between the strike price and the market rate impacts the amount of the swaption premium.
  For payer swaptions, the lower the intended strike price, the higher the premium. The lower (better) the interest rate you want the right to pay in the underlying interest rate swap, the more expensive the swaption will be. Conversely, for payer options, the higher the intended strike price, the lower the premium.

  The opposite applies to receiver swaptions. The premium will rise the higher (better) the interest rate you want to receive in the underlying swap. The premium will fall, the lower the interest rate you want to receive in the underlying swap.

- the expected risk (volatility) of the underlying swap rate.
  A swaption is the right to obtain a hedge by way of a swap if an expected risk materialises. If there is a high probability of the swaption being exercised given the market conditions at the date of the transaction, the premium will be high. Hence, it will be expensive to hedge an interest rate swap with strong price fluctuations.

- the term of the swaption.
  If you buy a swaption, its term will have an all-important influence on the amount of the premium. The longer the period you wish to hedge against fluctuations in the interest rate in question, the more expensive the swaption.

When the theoretical price has been fixed, a client margin is added to the transaction, which results in a negative market value at the date of the transaction. The negative market value corresponds to the present value of the client margin during the entire term of the transaction.

Risk factors
You should be aware that trading in swaptions involves substantial risk.

Under the executive order on risk-labelling of investment products, this product type is in the "RED" category.
The "Red" category consists of: "Investment products involving a risk of losing more than the amount invested, or product types which are difficult to understand.

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Selling swaptions
Selling swaptions involves the risk of the option leading to the conclusion of an interest rate swap with a negative value. The loss may be unlimited and higher than the option premium you receive.

During the life of the swaption, the market rate and expected market rate fluctuations will impact the market value of the swaption – depending on the option type. In the event of early settlement, you may suffer a loss equal to the absolute value of the negative market.

Buying swaptions
When you buy a swaption, the loss is limited to the loss of the premium paid.

Collateral
When you enter into transactions with Danske Bank as the counterparty, we may require that you provide collateral.

Special market conditions
Under special market conditions, it may be difficult or impossible to close a position; for example if, during periods of frequent price fluctuations, prices rise or fall to such an extent that we are unable to provide a price.

Tax
The tax treatment of gains or losses on interest rate swaps and swaptions depends on whether you are trading as a private individual or on behalf of a company.

Due to the complex nature of this area, we recommend that you consult an accountant or other professional adviser to clarify the tax and accounting consequences to you of trading in them.

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