

→ 10. swaption

MIFID complexity

IR 2

product description

The swaption may be the appropriate solution to guarantee a certain interest rate level of possible future long-term loan or deposit transactions. A swaption gives you protection against future adverse changes in long-term interest rates, while not excluding the possibility for you to profit from the advantages of favourable changes in long-term interest rates.

A swaption gives you an opportunity to enter into an interest rate swap at a fixed future time, with a fixed interest rate, for a fixed notional and with a predetermined interest rate payment frequency. This in practice means that an option right to enter into an interest rate swap is granted to the buyer of the option. By paying the option premium, the buyer of the option acquires the right to swap fixed interest rate payments for floating interest rate payments, or floating interest rate payments for fixed interest rate payments. Accordingly, the seller of the option undertakes the obligation to pay fixed or floating interest rate, depending on the specific option type, after the option is called. In most cases settlement is based on the reference interest rate fixing 2 days before the end of the interest period similar to an interest rate swap, however it is possible to agree otherwise.

There are two types of swaption, namely, the payer swaption which results in fixed interest rate payment, and the receiver swaption which results in floating interest rate payment:

By buying a payer swaption, you acquire a right to pay fixed interest rate and receive floating interest rate from a point in time set in advance. The seller of a payer swaption receives fixed interest rate and pays floating interest rate. A payer swaption may be advantageous for a company which has already drawn a specific loan at a favourable interest rate, but which would like to have protection against a possible future adverse turn in long-term interest rates. It can also be useful for companies running for tenders or signing project contracts, which would like, or have to, fix in some way or another the interest rate costs of a possible floating rate liability. It can provide protection for clients expecting lower interest rates on the expiry of the swaption, but who also are wary that interest rates may not evolve in accordance with their expectations, and who would like to have some guarantee for this occurring.

example for protection against increasing interest rates – buying of payer swaption:

a company has been awarded a contract in a tender, and project implementation will begin in 1 years' time. The company has a plan to take out a 3-year bullet loan to realise the project in 1 years' time. The 3-month EURIBOR is 0.50%, and the 3-year fixed interest rate is 0.85%. The company expects long-term interest rates to decrease; but, because it wants to fend off the effect of a potential interest rate increase, it buys a payer swaption with a 1.00% interest rate. The swaption premium is 0.078% of the notional, (that is, about 0.026% per year payable every 3 months). This has given the company a right to pay 1.00% of the notional value of the option to the bank for duration of 2 years, while the bank will pay floating interest rate to the client for 2 years, provided that in 1 year time the 3-year fixed interest rate is above 1.00% in the market.

By buying a receiver swaption, you will acquire a right to pay floating interest rate and receive in the meantime fixed interest rate, from a certain point in time fixed in advance. The seller of the receiver swaption pays fixed interest rate and receives floating interest rate.

The strike price of a swaption is the predefined fixed interest rate at which the buyer of an option enters a future interest rate swap.

At expiry date, the swaption can be settled in two alternative ways, as follows:

- the swap is entered into by the two parties
- net settlement between the parties

Different swaption strike prices give you different levels of protection. A swaption with a more advantageous strike price can give you more protection, but it is also more costly than another swaption with a less advantageous strike price.

parameters – buying of payer swaption	
notional	EUR 300 000
tenor of swaption	1 year
day of swaption exercise	in 1 year (the underlying IRS deal may come into effect)
variable notional	no
strike price of swaption	1.00% fixed rate
parameters of interest rate swap taking effect upon exercising the swaption	
notional of interest rate swap	notional of the loan
tenor of embedded interest rate swap	2 years
interest payment	at maturity in one sum
interest payable by client (strike price)	1.00% fixed rate
interest due to client	3-month EURIBOR
condition to exercise the option	the fixed interest rate level of the interest rate swap beginning 2 days after the exercise day of the swaption with the same parameters as the swaption is higher than the swaption strike
fixing day of floating interest rate	2 working days before onset of given interest period
interest calculation convention (fixed interest)	actual number of days / 360
interest calculation convention (floating interest)	actual number of days / 360
settlement of interest payment	net settlement at the end of each interest period
closing of interest rate swap before expiry	can be initiated by either party, at any time
possible outcomes on the expiry date of the swaption	
A) 2-year fixed interest rate below 1.00%	the swaption is not exercised
B) 2-year fixed interest rate above 1.00%	the swaption is exercised
B/1) payable by client	fixed 1.00% interest on the entire notional for 2 years
B/2) due to client	floating interest on the entire notional for 2 years
current 3-month EURIBOR	0.50%
current 3-year ICAP EURO offer rate against 6-month EURIBOR (Day count: ANN 30/360 vs 6M EURIBOR)	0.85%
premium of swaption (payable by client on the trade date)	0.078% * notional, EUR 234 up front (approx. 0.026% p.a., EUR 19.50 payable every 3 months)
possible scenarios at the end of the swaption's tenor based on the fixed rate of an interest rate swap with same parameters as the swaption	
fixed rate of an interest rate swap with same parameters as the swaption is above 1.00%	your company pays 1.00% interest on the loan in every interest period during the tenor of the interest rate swap
fixed rate of an interest rate swap with same parameters as the swaption is below 1.00%	your company pays 3-month EURIBOR on the loan in every interest period, the swaption is not exercised
best-case scenario (treasury transaction on a standalone basis)	At the exercise day of the swaption the fixed market interest rate calculated on the interest rate swap is above 1.00% and after that 3-month EURIBOR above 1.00% in every interest period. Your company receives the time proportional difference between 1.00% and 3 month EURIBOR for the actual notional amount in each interest rate period.
worst-case scenario (treasury transaction on a standalone basis)	At the exercise day of the swaption the fixed market interest rate calculated on the interest rate swap is above 1.00% and after that 3-month EURIBOR below 1.00% in every interest period. Your company pays the time proportional difference between 1.00% and 3 month EURIBOR for the actual notional amount in each interest rate period with an unlimited interest rate loss potential.

the market value of the position one year after the contract conclusion from the customer's point of view

market value: the cost of liquidating the position calculated at a given point of time and under the prevailing market terms and conditions (in case of a positive value the company can close the transaction with profit)

(assumption: there is parallel shift in the entire yield curve in the extent of the change of the 3-month EURIBOR, and the shape of the yield curve remains unchanged)

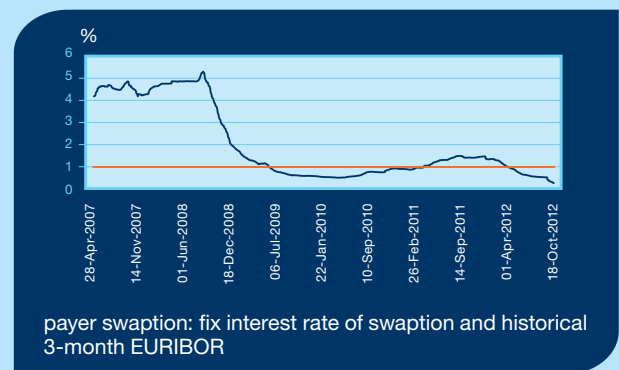
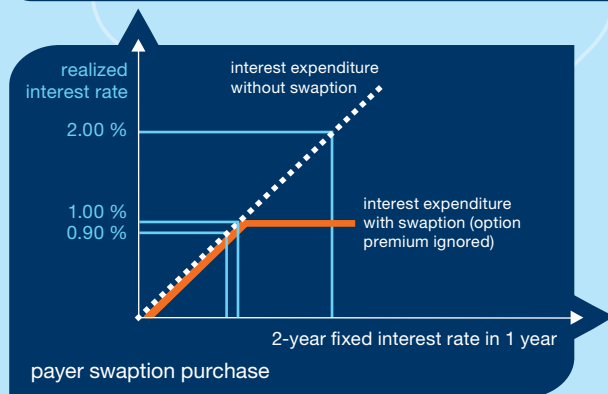
The number of possible outcomes is unlimited, and there may be even more extreme values than the ones presented below.

3-month EURIBOR in one year (received by client if negative, %)	market value of the position (EUR)
-1.00	0
0.50	0
2.00	5 580

financial outcome of some possible scenarios 2 years after the trade date, supposing that the 3-month EURIBOR evolves as below in the last quarter of the given year and the 2-year IRS evolves as below at the end of the first year

The number of possible financial outcomes is unlimited, and there may be even more extreme values than the ones presented below.

end of period (outstanding principal EUR 300 000)	2-year fixed interest rate 1 year later	is the swaption exercised?	3-month EURIBOR at the start of the interest period (%)	underlying exposure's financial outcome with no treasury transaction (3 months' interest expense without IRS, EUR)	profit / loss of the product on a standalone basis (net settlement at the end period, client pays if value is "+", EUR)	underlying exposure's financial outcome with the treasury transaction, hedged position (3 months' interest expense with swaption and premium due in the quarter, EUR)
2 years	below 1.00	no	0.00	0	0	19.5
2 years	below 1.00	no	1.00	750	0	(750+19.5)=769.5
2 years	below 1.00	no	1.50	1 125	0	(1 125+19.5)=1 144.5
2 years	below 1.00	no	2.50	1 875	0	(1 875+19.5)=1 894.5
2 years	above 1.00	yes	0.00	0	750	(750+19.5)=769.5
2 years	above 1.00	yes	1.00	750	0	(750+19.5)=769.5
2 years	above 1.00	yes	1.50	1 125	-375	(750+19.5)=769.5
2 years	above 1.00	yes	2.50	1 875	-1 125	(750+19.5)=769.5



The chart shows the interest level(s) of the treasury deal and the historical evolution of 3 month EURIBOR. The historical data is intended merely to compare the interest level(s) of the deal to the historical rates. Future evolution of interest rates and interest changes for the remaining tenor are unforeseeable in advance, actual profit and loss depends on the interest rate prevailing on the fixing days. The chart is not suitable to forecast interest rates and market value of the position.

advantages of transaction

- complete protection against future adverse changes in long-term interest rates: the worst outcome is known already in advance of entering into a loan / deposit transaction
- full benefit of advantageous future interest rate changes
- swaptions tend to be cheaper than caps for a given period as the uncertainty stops at the expiry day. Volatilities tend to be lower for long term rates than for short term instruments
- can be used to hedge both loans and deposits
- a swaption can be attached to a loan extended by, or deposit placed with, another financial institution, because the swaption is (in legal terms) separate from the underlying loan or deposit transaction
- available in most liquid currencies
- the date of expiry, the tenor, the strike price and the frequency of interest payments of a swaption can be adapted to customer needs, in accordance with your expectations, plans and budget; the change of one parameter will cause the rest of the parameters to change, too
- available for any repayment schedule
- the option can be closed in the market at any time by means of a counter trade (i.e. selling of the option)

risks of transaction

- similarly to an insurance premium, the option premium is paid up front; the holder of the option is in a better position if at expiry the option needs not to be exercised, since then the lower level of interest rates will compensate for the prepaid option premium
- if the underlying loan is repaid before maturity, it is advisable to close (i.e. sell) the swaption as well, since there will no longer be any risk arising from the underlying business; closing the option can generate a loss, because, although an option never has a negative value, the current price of the option at the time of closing the position may be lower, depending on the market situation, than the original price at which the option was bought; similarly, if you want to repurchase an option sold at the outset, it is possible that the price of the repurchase will be much higher.
- when exercising a swaption, the holder of the option pays or receives fixed interest rate over the entire tenor of the transaction, so this hedging strategy is less flexible than buying an interest rate option (cap or floor), for instance, because in the latter the client can profit in each interest period from interest rate levels more favourable than the option interest rate, as results from the current market situation; at the same time, an interest rate option is, for the same reason, a more costly way of protection than a swaption.

- the market value of interest rate derivatives is determined by the evolution of market interest rates, the length of interest rate periods, the number of days remaining until the expiry of the transaction, the daycount method and the evolution of the notional until expiry. In the case of an interest rate option the evolution of market volatility also influences the market value. The drop in market liquidity could lead to a bid-offer spread widening, which could also negatively affect the market value of the position.
- if the company sells a swaption, the change in market value could lead to an obligation of temporary or permanent increase of collateral which may affect the company's liquidity and solvency negatively. In case of exceptional market circumstances (eg, money market and other crisis) the negative market value of the position from the Client's viewpoint could reach so extreme levels that providing the

adequate collateral may lead to the company's insolvency. Moreover, failure to provide additional collateral in time might lead to the closure of open positions thus prompt realization of losses, which may affect the company's liquidity and solvency negatively.

- chapter I/b. entitled "Risk Factors" of "K&H Treasury Handbook of Market Risk Management" lists those risks that do not originate exclusively from the nature of the product described here, but rather, from other factors.

product structure

The product is built up of an interest rate swap option (swaption). The sections on interest rate swap options of Chapter I/c. entitled "5 Basic Products" of "K&H Treasury Handbook of Market Risk Management", also applies to this product.