9. knock-in floor collar

MIFID complexity
IR 3

product description

If you find the fixed rate of the current IRS too high, but wish to have protection near the current IRS level against rising interest rates, a knock-in floor collar is the obvious solution. Similarly to FX options, interest rate options can also be combined with each other, and combining a knock-in floor with a regular cap option results in a zero cost knock-in floor collar. The structure can be built up in way where the cap and the knock-in floor strike is the same (in this case the strike will be less favourable than the IRS level). With this product you can benefit from falling interest rates until the barrier level and may gain protection near the current IRS level against rising interest rates.

A knock-in floor collar involves the simultaneous conclusion of a knock-in floor and a cap option. Your company buys a cap option that provides protection against unfavourable interest rate moves and sells a knock-in floor option to ensure that the transaction is zero cost. The floor options comes into effect in a given interest period if the barrier level is reached, and limits the benefits of favourable interest rate movements. This product can be particularly advantageous in case you expect interest rates to increase less than market expectations reflected in the yield curve, or slightly decrease in the future.

Knock-in cap collar concluded for a loan: the company buys a cap and sells a knock-in floor option:

Possible scenarios on the pre-agreed maturity dates (two banking days before each interest period)

- market interest rate ≤ knock-in barrier:
  the floor comes into effect, You have an obligation to pay interest at the floor rate, which means that you will pay to the bank the time proportional difference between the market interest rate and the floor interest rate
- knock-in level < market interest rate ≤ floor strike: t
  here is no settlement
- floor strike < market interest rate ≤ cap strike: there is no settlement
- cap strike ≤ market interest rate:
  you are entitled to pay according to the cap strike instead of the market interest rate, i.e. the Bank will pay the company the time proportional difference between the market and the cap interest rates.

In most cases settlement is based on the reference interest rate fixing 2 days before the end of the interest period, however it is possible to agree otherwise.

an example for a zero cost knock-out cap collar transaction: a company has a 3 year bullet loan with a notional of 300 000 EUR with a floating interest rate payment, on which it will be paying interest quarterly on the 3-month EURIBOR rate. The current 3-month EURIBOR is 0.50%. The fixed EUR interest rate on is 0.85%. The company believes that interest rates will not change significantly in the future, but it would nevertheless like to be protected against a possible sudden surge in interest rates. It also believes that the 3-month EURIBOR rate is not going to drop below 0.30% in the coming 3 years. Thus it concludes a zero cost knock-in floor collar for term of 3 years, i.e. it buys a cap option with a 0.70% strike and simultaneously sells a knock-in floor option with a 0.70% strike and a barrier level of 0.30% for the same notional amount, in line with the notional schedule above. Thus it maximises its interest expenses at 0.70% and in exchange it is prepared to accept that it is protected until 0.30% and if 3-month EURIBOR reaches 0.30% then an obligation to pay fixed interest at 0.70% comes into effect. Moreover, it accepts that the protection against rising interest rates is at a higher level than the current IRS rate.

parameters of a knock in floor collar transaction	
initial notional	EUR 300 000
tenor	3 years
variable notional	no
floor interest rate	0.70%
cap (maximum) interest rate	0.70%
knock-in barrier	0.30% (applicable separately to each interest period)
frequency of interest payment	quarterly
interest rate calculation convention	actual number of days/360
fixing day of floating interest rate	2 working days before onset of given interest period
settlement of interest payments	net, at the end of each interest period
precondition for settlement of floor interest payment	if the 3-month EURIBOR is below 0,30% two banking days before the start of the interest period
precondition for settlement of cap interest payment	if the 3-month EURIBOR fixing rate is above 0.70% two banking days before the start of the interest period
current 3-year ICAP EURO offer rate against 6-month EURIBOR (Day count: ANN 30/360 vs 6M EURIBOR)	0.85%
current 3-month EURIBOR	0.50%
option premium (paid by the client on the trade date)	none
possible scenarios at the end of each interest period assuming that on the fixing dates the 3-month EURIBOR is	
A) on the fixing days 3-month EURIBOR above 0.30%	
A/1) 3-month EURIBOR at or above 0.70%	your company pays 0.70% interest on the loan in every interest period
A/2) 3-month EURIBOR below 0.70%	your company pays 3-month EURIBOR on the loan in every interest period
B) on the fixing days 3-month EURIBOR at or below 0.30%	your company pays 0.70% interest on the loan in every interest period
best-case scenario (treasury transaction on a standalone basis)	On every fixing day 3 month EURIBOR above 0.70%. Your company receives the time proportional difference between 0.70% and 3 month EURIBOR for the actual notional amount in each interest rate period.
worst-case scenario (treasury transaction on a standalone basis)	On every fixing day 3 month EURIBOR below 0.30%. Your company pays the time proportional difference between 0.70% 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)

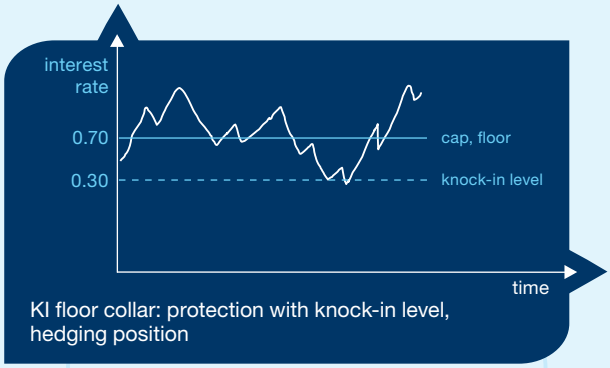
The number of possible outcomes is unlimited, and there may be even more extreme values than the ones presented below.

3-month EURIBOR in one year (%)	market value of the position (EUR)
-1.00	-2 637
0.50	-1 155
2.00	6 390

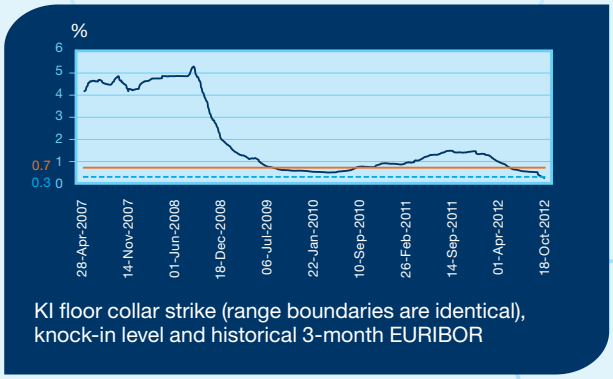
financial outcome of some possible scenarios 1 year after the trade date, supposing that the 3-month EURIBOR evolves as below in the last quarter of the given year

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)	3-month EURIBOR at the start of the interest period (%)	underlying exposure's financial outcome with no treasury transaction (3 months' interest expense without knock-in floor collar, 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 knock-in floor collar, EUR)	underlying exposure's financial outcome with the treasury transaction, hedged position (3 months' interest expense with 0,60% IRS, EUR)
1 year	-1.00	-750	+1 275	525	450
1 year	0.00	0	+525	525	450
1 year	0.50	375	0	375	450
1 year	1.50	1 125	-600	525	450
1 year	2.50	1 875	-1 350	525	450



KI floor collar: protection with knock-in level, hedging position



KI floor collar strike (range boundaries are identical), knock-in level and historical 3-month EURIBOR

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

- limited benefit from favourable interest rate movemets until the knock-in floor barrier level
- unlimited protection against unfavourable interest rate movements from the cap strike
- the maximum / minimum future interest expense/income is predetermined (the worst scenario is known)
- can be used to hedge both loans and deposits.
- it can also be concluded for loans granted by or deposits placed with other financial institutions, since the collar deal is separate from the underlying loan or deposit transaction.
- zero cost, this deal is available in most liquid currencies free of any special premium.
- the expiry date, the cap and floor interest rates (strikes), the knock in barrier and the frequency of interest payments can be set at your will, 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.
- if no longer needed, the knock-in floor collar can be closed at any time before expiry, by means of a counter trade.

risks of transaction

- obligation to pay interest at a higher than the market rate after reaching the knock-in level
- protection level is less favourable than the fixed interest rate applicable to the same tenor
- limited benefit from favourable interest rate movements
- If the underlying loan is repaid, it is advisable to close the knock-in cap collar too, since there is no longer any risk resulting from your core business. The closing of a collar deal before expiry will entail an obligation to settle, including the possibility of a loss.
- 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 day-count method and the evolution of the notional until expiry. In the case of interest rate options the market value is also influenced by the evolution of market volatility. The drop in market liquidity could lead to a bid-offer spread widening, which could also affect the market value of the position negatively.
- 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 (e.g. money market and other crises) the negative market value of the position from the Client's viewpoint could reach such extreme levels that providing sufficient collateral may cause the company to become insolvent. 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 a barrier and a plain vanilla interest rate option. The sections on barrier and plain vanilla interest rate options of Chapter I/c. entitled "5 Basic Products" of "K&H Treasury Handbook of Market Risk Management", also applies to this product.