

## ➔ 2. cross-currency interest rate swap

MIFID complexity

IR 2

### product description

If, for administrative or other reasons, your company cannot freely convert an already existing foreign currency loan to another currency, for instance because it is a government subsidised or a syndicated loan, or because specific contract clauses exclude the possibility of conversion, but you would still like to achieve foreign exchange and/or interest exposure that is different from what you have now, you can conclude a cross-currency interest rate swap.

The point of this transaction is that your company swaps the currency and interest basis of your loan in a specific currency for another currency and the interest rate basis associated with that currency. By means of such a swap your company will receive from the bank the interest rate related to the currency of the original loan, while paying interest at the rate associated with the other currency. The various components of a cross-currency interest rate swap are, from a technical point of view, swapped as follows:

### currency swap (exchange of principals):

When the transaction is concluded, the outstanding loan is converted into the other currency at the current market rate. Normally, this exchange rate will remain fixed over the entire tenor of the cross currency swap, which means that the settlement of repayments of capital and interest, as well as the conversion of the outstanding loan into the original currency on the expiry date of the swap, will be executed at this exchange rate. You can specify that principals should be exchanged at the:

- start date (initial exchange)
- end date (final exchange, including intermediate payments on amortization dates, if any)
- both the start date and the end date (initial, intermediate and final exchange)
- neither date

### In case of principal exchange, gross settlement takes place.

(In case of an already existing loan there is no initial exchange of principal, but the loan notional in the other currency can be calculated using the original notional of the loan and the fixed exchange rate)

Independently from whether the exchange of principals occur or not, the deal entails currency and interest rate risk, i.e. the market value of the deal changes continuously depending on exchange rate and interest rate movements. If however only the currency swap part of the whole deal is observed then the potential profit/loss (together with the underlying loan) is equal as if the loan's original currency denomination has been changed. On a net basis the cash flow of the original loan and the cross-currency swap will equal to a cash-flow of a converted loan at every moment. Taking into account only the currency swap part of the deal however (see below), the picture is more nuanced: it also affects market value, thus the market value of the entire cross-currency interest rate swap deal will not be the same as the book value of a converted loan with the same parameters at the same time.

### the swapping of interest may take various forms:

- fixed interest rate in both currencies
- floating interest rate in both currencies
- fixed interest rate in one currency and variable in the other

There is a net settlement of interest payments at the end of the interest periods. The potential interest rate gain or loss realised on this deal equals the difference between the interest received from, and payable to, the bank (interest rate risk).

Since the cross-currency interest rate swap will not change the conditions of the underlying loan transaction, the above transactions will in practice mean the synthetic construction of a foreign currency loan: **original loan transaction + cross-currency swap = synthetic foreign currency loan**

**example:** let us assume that a company has a loan of HUF 290 000 000, with a remaining tenor of 5 years, repayment occurs at maturity in one sum. For this loan, the company's interest obligation is defined as a function of the 3-month EURIBOR (we disregard credit margin in this example). The client would like to reduce the related interest expenditure and it expects euro interest rates to remain below forint interest rates in the next 5 years. Therefore, it enters into a 5-year cross-currency interest rate swap as part of which its HUF loan is technically "converted into EUR" at the current EUR/HUF spot rate of 290, and the company will pay instead of 3-month BUBOR a floating 3-month EURIBOR + 2.60% interest rate for the remaining tenor at the end of each interest payment period. The original loan agreement is not amended!

Therefore, the company obtains an exposure identical of having a EUR loan where it pays interests and repayment the capital at the end of the tenor in EUR. (By means of such a swap your company will receive from the bank the interest rate and capital payments related to the original loan in HUF)

If, however, the company's revenues are generated in EUR and are sufficient to pay the capital and interest repayments then a cross-currency interest rate swap deal reduces risks associated from your exposure fully or partly, i.e. in practice you will not run exchange rate risk (underlying exposure and treasury deal jointly). However, a cross-currency interest rate swap deal (on a standalone basis) may have negative market value (meaning a loss to your company) over the tenor.

The HUF loan is technically "converted into EUR" at the current EUR/HUF spot rate. This means in practice that if the exchange rate is 290 EUR/HUF on the trade date, then this rate remains fixed during the entire tenor of the cross-currency-swap to calculate the settlement of the capital and interest payments and any remaining capital conversion at the end of the tenor of the deal. Since the transaction's value is marked-to-market every day, if (everything else remaining unchanged) the EUR/HUF rate is above 290, the marked-to-market value of the deal is negative, and if the EUR/HUF rate is below 290, the marked-to-market value of the deal is positive. (see below the possible market values of the position)

#### parameters of the cross-currency interest rate swap

notional of original loan	HUF 290 000 000
original loan interest rate	3M BUBOR
repayment	at maturity in one sum
tenor of cross-currency interest rate swap	5 years
currency pair of cross-currency interest rate swap	EUR/HUF
spot exchange rate at the time of pricing	290 EUR/HUF
notional of synthetic EUR loan	original loan amount / spot rate: HUF 290 000 000 / 290 EUR/HUF = EUR 1 000 000
interest rate swap	3M BUBOR $\bar{\text{D}}$ 3M EURIBOR + 2.60%
client pays to bank	notional of synthetic EUR loan * (3M EURIBOR + 2.60%) * actual number of days / 360
bank pays to client	notional of original HUF loan * (3M BUBOR) * actual number of days / 360
settlement of capital and interest payments	net settlement at the end of each interest payment period
duration of interest periods	3 months
current 3-month EURIBOR	1.00%
current 3-month BUBOR	7.00%
deal premium	zero

#### the interest rate payment cash flows due at the end of the first interest period, assuming an unchanged EUR/HUF exchange rate:

- payable by the client to the bank:  $1\,000\,000 * (1.00\% + 2.60\%) * 90 / 360 = 9\,000$  EUR
- payable by the bank to the client:  $290\,000\,000 * 7.00\% * 90 / 360 = \text{HUF } 5\,075\,000$
- settlement:  $5\,075\,000 \text{ HUF} - 9\,000 \text{ EUR} * 290 = \text{HUF } 2\,465\,000$  which will be debited on the client's account, this is your interest rate profit

#### The capital repayment cash flows due at the end of the tenor:

The swapping of interest payments takes place at the end of the tenor as described above.

As a result of this deal, the client will have to pay back EUR 1 000 000 in 5 years and receives HUF 290 million from the bank (this latter serves as the capital repayment of the HUF loan). The company incurs exchange

rate risk if it doesn't have the sufficient EUR amount at its disposal. In that case it has to buy EUR on the interbank FX market that could be done by a forward deal any time before that date or with a spot conversion at the expiry date. If it can buy EUR at a higher rate than 290 EUR/HUF, then the company has an exchange rate loss. If it can buy EUR at a lower rate than 290 EUR/HUF, then the company has an exchange rate gain.

#### the market value of the position at two weeks after the trade date from the customer's point of view

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

(assumption: except for the spot market rate, all other factors remain unchanged, monthly HUF-EUR interest differential remains 1 forint)

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

spot exchange rate end of 2012 (EUR/HUF)	market value of the position (HUF)
260	30 550 000
290	-3 020 000
320	-36 580 000

## foreign exchange and interest rate risk of a cross currency swap deal in a given interest rate period

foreign exchange risk (assuming unchanged interest rate levels) – over a period of 3 months, 3-month EURIBOR: 1.00%, 3-month BUBOR: 7.00%				
exchange rate	interest payable by client (EUR)	cash flows in interest rate swap (HUF)		net result of interest rate swap (HUF)
EUR/HUF	interest paid by client (EUR)	interest paid by client (HUF)	paid by bank (HUF)	paid by bank (HUF)
260	9 000	2 340 000	5 075 000	2 735 000
290		2 610 000		2 465 000
320		2 880 000		2 195 000

interest rate risk (assuming unchanged exchange rate levels) – over a period of 3 months at the end of the first interest payment period				
EURIBOR+2,6%	interest paid by client (EUR)	interest paid by client (HUF)	paid by bank (HUF)	paid to client (HUF)
3,10%	7 750	2 247 500	5 075 000	2 827 500
3,60%	9 000	2 610 000		2 465 000
4,10%	10 250	2 972 500		2 102 500
BUBOR	interest paid by client (EUR)	interest paid by client (HUF)	paid by bank (HUF)	paid to client (HUF)
6,00%	9 000	2 610 000	4 350 000	1 740 000
7,00%			5 075 000	2 465 000
8,00%			5 800 000	3 190 000

### advantages of transaction

- exposure to the volatility of the HUF interest market is swapped for a more advantageous interest market exposure (in time of editing this Handbook e.g. EUR, CHF or USD)
- in case of subsidized or other foreign currency loans where the loan agreement cannot be changed, but the company has HUF surplus, the foreign currency loan can be swapped into a HUF loan. Therefore the company doesn't have to buy foreign currency to pay the debt service.
- swapping the cash-flow of a fixed or float interest rate loan in a given currency into the future cash-flow of a fixed or float interest rate loan in a different currency may fully or partially hedge risks arising from the company's underlying exposure (e.g. a company with EUR revenue swaps its floating rate HUF loan into fixed rate EUR loan)
- foreign exchange risk and interest rate risk deriving from the cross-currency swap can be managed by other treasury instruments. If the company does not possess the necessary forint or foreign exchange amount to settle its obligations derived from the product, it may manage this risk by concluding treasury transactions or if the company runs interest rate risk for a given expiry it may conclude the cross-currency swap with fixed interest payments, consequently the interest rate risk is managed.
- this deal can be concluded for loans extended by other banks, because the cross-currency interest rate swap is separate from the underlying loan transaction
- available for loans and deposits
- available in most liquid currencies
- available for any repayment schedule
- the expiry date, the currency and the frequency of interest payment 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
- your position can be closed at any time before expiry, with the result of such closing settled by net settlement.

### risks of transaction

- concluding this deal involves running foreign exchange risk with respect to the notional outstanding in the loan at any given time, i.e. the position's market value changes continuously even if the deal eliminates partly or fully the risks associated to the underlying exposure
- if the difference between the two interest rates decreases during the term of the deal, the possible interest savings will be reduced, too, i.e. in case of floating interest rates the future interest rate differentials are unknown in advance
- if the underlying loan is repaid, it is advisable to close the cross-currency interest rate swap, too, because there will no longer be any risk from the core business.
- if the currency of the original underlying loan transaction is depreciated to a significant degree during the term of the cross-currency swap, then closing your position may result in foreign exchange loss, which must be deducted from the interest savings you realise on the deal if you changed into an interest base, which resulted in lower interest payments.
- if the company changed into an interest base, which results in lower interest payments (e.g. swapping a HUF loan into a EUR loan) and the possible foreign exchange loss is in excess of the interest savings made possible by the deal, then, in retrospect, you would have been better off not concluding the swap, and leaving your loan in the original currency
- if the company changed into an interest base, which results in higher interest payments (e.g. swapping a EUR loan into a HUF loan) and the currency of the new loan transaction is depreciated to a significant degree during the term of the cross-currency swap then the deal protects you from realizing exchange rate loss (which would occur without the deal due to the denomination of the loan) By closing the deal you may realise exchange rate profit, which would decrease the interest rate reduction achieved by the deal. If the possible interest rate profit is in excess of the avoided exchange

rate loss possible by the deal, then, in retrospect, you would have been better off not concluding the swap, and leaving your loan in the original currency.

- the market value of a cross-currency swap is determined by the evolution of the spot exchange rate, the interest rate levels of the two currencies for the given tenor, the difference between the interest rates for the given tenor, evolution of basis swaps, 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. More information can be found on basis swaps in chapter I/c. entitled “5 Basic Products” of “K&H Treasury Handbook of Market Risk Management”. The drop in market liquidity could lead to a bid-offer spread widening, which could also negatively affect the market value of the position.
- the change in market value could lead to an obligation of temporary or permanent increase of collateral which may affect negatively the company's liquidity and solvency. 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 negatively the company's liquidity and solvency.
- 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**

This product is the combination of a currency swap and an interest rate swap. The explanation concerning interest rate swaps in point 1. entitled “interest rate swap” in chapter III/a. “interest rate risk of loans” of “K&H Treasury Handbook of Market Risk Management”, as well as concerning currency swaps in chapter VII “Glossary”, and point 2. “cross currency swap” of III/b. “currency of loans” will apply to this product.