

➔ 11. differential swap

MIFID complexity

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A differential swap allows the company to pay interests at a rate linked to an interest rate index in a different currency than that of the loan and the interest payments, without running exchange rate risk. With the transaction a HUF loan with a floating interest of 3-month BUBOR can be converted to a HUF loan with a floating interest of 3-month EURIBOR.

product description

The differential swap is similar to a plain vanilla interest rate swap which allows the parties to exchange the interest payments without amending the original loan- or deposit contract. The difference is that the differential leg has to be based on a floating rate which is called the “differential floating leg” and this floating rate is set by reference to an index which is originally NOT denominated in the same currency as the underlying loan is. For example the differential floating leg is based on EURIBOR but payable on a HUF notional by the party that pays the differential floating leg.

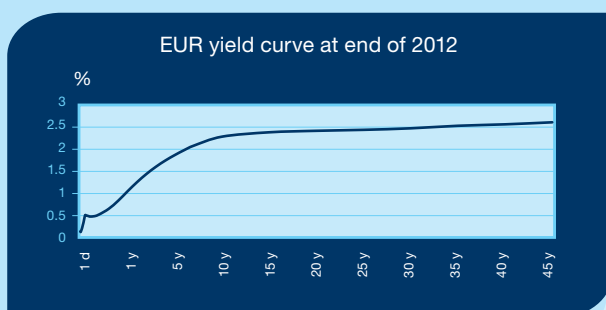
It is important to note that both legs of the differential swap are paid in the same currency. The interest rate index in the different currency is only used to determine the coupon of the interest payment.

Based on swapping interest rate payments the following differential swap transactions can be made:

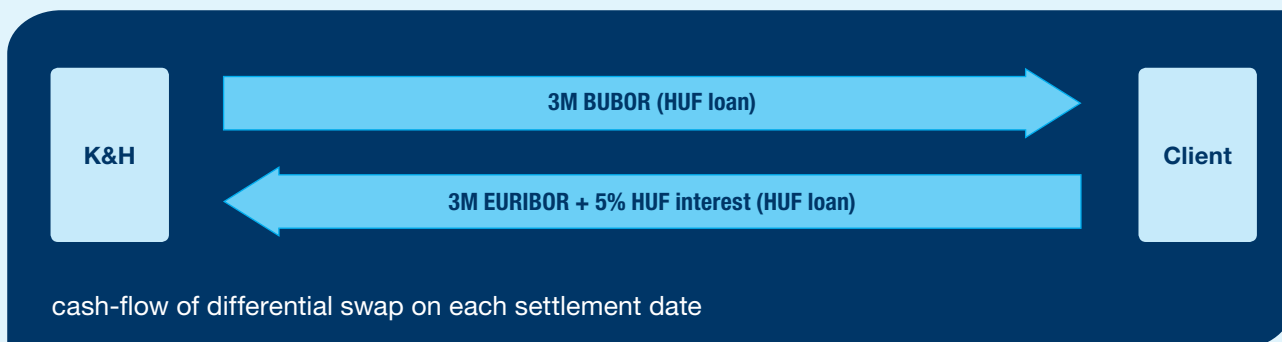
- one party pays a fixed rate and the other pays a floating rate. This is called a fixed to floating differential swap. Both the fixed and the floating rates are paid in the same currency.
- both parties pay a floating rate, but each floating rate is linked to a different interest rate index, e.g. one is linked to BUBOR and the other to EURIBOR. This is called a floating to floating differential swap. Both floating legs are payable in the same currency.

As the difference between the HUF interest rate and rates denominated in most foreign currencies is positive, in a differential swap **the foreign index is increased by the interest rate differential of the two currencies amended by the correlation of the two currencies.** Credit margins are ignored in the calculations below.

example for floating to floating differential swap: a company has a 5 year bullet loan with a notional of 100 000 000 HUF with a floating interest rate payment, on which it will be paying interest quarterly on the 3-month BUBOR rate. The current 3-month EURIBOR is 1%, the 3-month BUBOR is 7.00%. The company wishes to change the BUBOR interest rate base into EURIBOR for 5 years, as it expects EURIBOR rates to stay around current levels in the medium term and does not expect BUBOR rates to decrease in the foreseeable future. It also expects to benefit from a decrease in interest rates not reflected in the yield curve (see EUR yield curve below) compared to the BUBOR interest rate base. Thus it concludes a differential swap deal and changes 3-month BUBOR into 3-month EURIBOR + 5% for 5 years on the HUF loan's notional. Interests continue to be paid in HUF. The floating EUR rate on the trade date is more favourable than the 3-month BUBOR.



The yield curve depicts the average annual interest rate of investments with the same risk but with different tenors (that is, annualised yields up to the maturity date) as a function of the maturity date, the basis of which can be either government bonds, credit facilities or swaps. An upward sloping (normal) yield curve can be the result of expectations of rising future interest rates, but the reverse is not true: an upward sloping yield curve does not necessarily indicate that interest rates will surely increase in the future. Expectations about yield curves best prove correct in the long run. Among others interest rate swaps are based on levels of the actual yield curve.



parameters of a differential swap	
notional	HUF 100 million
tenor	5 years
amortization	no
interest rate fixing swap	3-month BUBOR ÷ 3-month EURIBOR + 5.00% in HUF
interest due to client	3-month BUBOR in HUF
interest payable by client	3 month EURIBOR + 5.00% in HUF
frequency of interest payment	quarterly
interest rate calculation convention	actual number of days / 360
settlement of interest payments	Net, at the end of each interest period
current 3-month EURIBOR	1.00%
current 3-month BUBOR	7.00%
transaction cost	zero
possible scenarios at the end of each interest period assuming that on the fixing dates the 3-month EURIBOR is	
3-month BUBOR below 3-month EURIBOR+5% in HUF	your company pays 3-month EURIBOR+5% on the loan in HUF
3-month BUBOR above 3-month EURIBOR+5% in HUF	your company pays 3-month EURIBOR+5% on the loan in HUF
best-case scenario (treasury transaction on a standalone basis)	On every fixing day 3-month BUBOR above 3-month EURIBOR + 5% in HUF. Your company receives the time proportional difference of between 3-month BUBOR and 3 month EURIBOR + 5% 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 BUBOR below 3-month EURIBOR + 5% in HUF. Your company pays the time proportional difference of between 3-month BUBOR and 3 month EURIBOR + 5% 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)
0.00%	4 500 000
1.00%	-510 000
2.00%	-5 800 000

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 and 3-month BUBOR is 7.00%

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

end of period	3-month EURIBOR at the start of the interest period (%)	underlying exposure's financial outcome with no treasury transaction (3 months' interest expense without differential swap, HUF)	profit / loss of the product on a standalone basis (net settlement at the end period, client pays if value is "+", HUF)	underlying exposure's financial outcome with the treasury transaction, hedged position (3 months' interest expense with differential swap, HUF)
1 year	0.00	1 750 000	-500 000	1 250 000
1 year	1.00	1 750 000	-250 000	1 500 000
1 year	2.00	1 750 000	-	1 750 000
1 year	3.00	1 750 000	250 000	2 000 000
1 year	4.00	1 750 000	500 000	2 250 000

advantages of transaction

- a differential swap allows a company to take a position linked to an interest rate index denominated in a currency that differs from the currency of the loan/deposit without running exchange rate risk. For example, a company can pay interest in HUF linked to EURIBOR on a HUF loan without changing the original currency of the loan and therefore without running exchange rate risk.
- the swap can be combined with loans as well as deposits.
- you can conclude the deal for loans extended by, or deposits placed with, other financial institutions, as well, because this deal is separate (in legal terms) from the underlying loan or deposit transaction
- no extra costs or fees
- can be concluded in most liquid currencies
- the date of expiry, the currency and the reference of the „differential floating leg” as well as the periods of interest rate 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
- can be concluded to fit any repayment schedule
- your position can be closed at any time before the expiry date, resulting, of course, in a profit or a loss, depending on the current market situation at the time concerned.

risks of transaction

- in the end, your company might pay/receive interest at a much higher/lower rate than the market rate applicable to the underlying transaction. For example, a company that has a HUF loan based on BUBOR enters into a differential swap exchanging the BUBOR to EURIBOR and anytime during the tenor the EURIBOR + “differential” becomes higher than the BUBOR, the interest to be paid will become higher than just simply based on BUBOR applied on the original terms of the credit contract. The potential interest loss can be unlimited.
- if the underlying loan is repaid, it is advisable to close the differential swap, too, since there is no longer any risk resulting from your core

business. Because of the fluctuation of market rates, the closing of a differential swap before expiry involves settlement obligations, which may result in a profit or a loss, depending on the current situation in the interest rate market at the time concerned. The potential loss can be unlimited.

- 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 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 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 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.

You can find the following table useful when creating hedging strategy. The table summarizes the market value evolution of the specific deals as a function of floating interest rates. Thus it might prove useful in helping you to find the right deals which correspond with your expectations.

profit / loss of interest rate hedging deal in function of the evolution of the underlying loan's floating rate, the floating remains the same in every interest period after the initial change (in case of upward sloping yield curve on the trade date)

deal type	extreme interest rate decline	small interest rate decline	no significant interest rate decline	small interest rate rise	extreme interest rate surge
interest rate swap	---	-	+/-	++	+++
fixed rate loan	---	-	+/-	++	+++
step up IRS	---	-	+/-	++	+++
forward rate agreement	---	--	+/-	+/-	+++
purchase of cap option	-	-	-	++	+++
purchase of cap option with knock-out level	-	-	-	+++	---
interest rate collar	---	-	+/-	+	++
interest rate collar with knock-out cap	---	-	+/-	+++	---
interest rate collar with knock-in floor	---	--	+/-	+	++
swaption	--	-	-	++	+++
differential swap, assuming no change in 3-month EURIBOR	---	-	+/-	++	+++