3. option for buying foreign currency: buying an option (right) + selling an option (obligation) = forward

MIFID complexity
FX 2

3.a. right to buy foreign currency (buying of EUR call option)

product description

When you buy a EUR call option, your company will acquire the right to buy foreign currency on a specific delivery date and at a specific strike rate, both set in advance, provided that on the expiry date the spot rate is above the strike rate. Similarly to a forward deal, this option will give you complete protection at the level of the strike rate against the depreciation of the forint.

If on the expiry date the spot rate is lower than the strike rate, your company will have a right to buy euros at the spot rate prevailing on expiry but you will not exercise this right. This means that, as opposed to a forward agreement, buying a EUR call option gives your company the possibility to derive 100% benefit from a potential appreciation of the forint (below the strike rate). In return for this benefit, the option comes at a price, paid by the buyer of the option in the form of a premium upon concluding the deal. In contrast to a forward deal, then, if you buy an option, your potential foreign exchange loss is limited to the amount of the option premium.

Costs and revenues of the underlying exposure can compensate both the potential gains and losses of the deal, as long as the company assesses its underlying exposure and market situation properly. The deals are made in order to stabilize the results, not to realise standalone financial gain.

example: a Hungarian importer expects to incur, a year from now, EUR 100 000 in expenses. Let us assume that the current spot exchange rate is 290 EUR/HUF, and the one-year forward rate is 302 EUR/HUF. Because the company expects that on the expiry date the spot rate will be much more advantageous than the forward rate, and because in order to achieve an appropriate profit margin it wants to avoid by all means having to buy euros on the expiry date at an exchange rate worse than the forward rate, it buys a European type EUR call option at a strike rate of 302 EUR/HUF (equalling the forward rate). The premium charged for buying the EUR call option is 3.50% of the notional, or else 302 * 3.50% = 10.57 HUF per EUR, payable when the deal is concluded.

Taking into account the option premium paid, this company will realise on expiry an exchange rate that is the same as the regular forward rate if on the expiry date the exchange rate level is (302 – 10.57 =) 291.43. (In this example we ignored that the premium should carry interest as well).

The option's strike rate may be different from the forward rate available for given tenor. In that case the option premium will be different as well.

parameters of the option – buying of EUR call option	
notional amount	EUR 100 000
currency pair	EUR/HUF
tenor	1 year
expiry date (date of exchange rate monitoring)	2 business days before end of tenor
exchange rate monitoring	EUR/HUF spot rate at 12:00 p.m. (CET) on the expiry date
settlement date	end of tenor
spot rate prevailing at pricing	290 EUR/HUF
forward rate prevailing at pricing	302 EUR/HUF
ATMF volatility	15%
strike rate	302 EUR/HUF
option premium (payable by the client on the trade date)	3.50% * notional amount = 10.57 HUF for each EUR (HUF 1 057 000)
possible scenarios on expiry depending on the spot market rates at 12:00 p.m. on the expiry date	
exchange rate is below 302 EUR/HUF	Your company has a right but not an obligation to buy euros, but it does not exercise the option. Your company can buy euros at the spot rate prevailing on expiry.
exchange rate is at or above 302 EUR/HUF	Your company has a right to buy euros, and it exercises the option. It can buy EUR 100 000 at a rate of 302 EUR/HUF.
best-case scenario (treasury transaction on a standalone basis)	The EUR/HUF spot rate is above 302 on the expiry date. Your company has a right to buy euros. In this case, your company can buy EUR 100 000 at a rate of 302 EUR/HUF.
worst-case scenario (treasury transaction on a standalone basis)	The EUR/HUF spot rate is below 302 on the expiry date. Your company will have a right, which will not be exercised. In this case, your company can buy euros at the spot rate prevailing on expiry (below 302 EUR/HUF). The resulting loss equals the amount of the option premium.

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

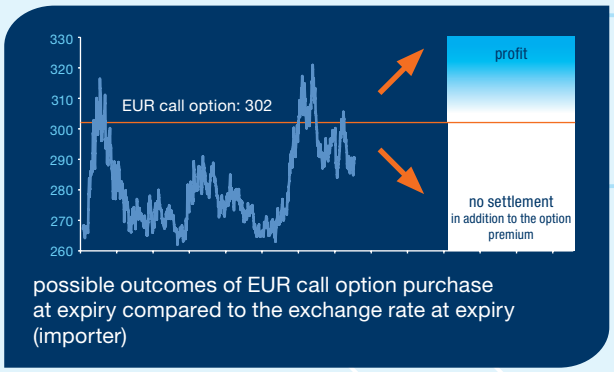
market value: the cost of closing the position calculated at a given point of time and under the prevailing market terms and conditions(the deal can be closed with profit if the market value is positive) (assumption: except for the spot market rate, all other factors are unchanged)
The number of possible outcomes is unlimited, and there may be even more extreme values than the ones presented below.

spot rate in two weeks (EUR/HUF)	market value of the position (HUF)
270	7.17 HUF per EUR * notional amount = 717 000 HUF
300	18.62 HUF per EUR * notional amount = 1 862 000 HUF
330	42.73 HUF per EUR * notional amount = 4 273 000

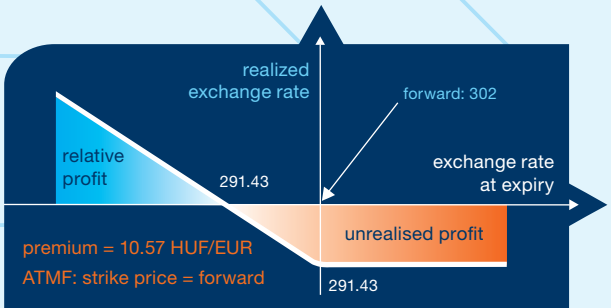
financial outcome of some possible scenarios on the expiry date

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

exchange rate on the expiry date (EUR/HUF)	underlying exposure's financial outcome with no treasury transaction (HUF)	profit / loss of the product on a standalone basis (HUF)	underlying exposure's financial outcome with the treasury transaction, hedged position (HUF)
270	270 * 100 000 = 27 000 000	0 – 1 057 000 = - 1 057 000	270 * 100 000 + 1 057 000 = 28 057 000
300	300 * 100 000 = 30 000 000	0 – 1 057 000 = - 1 057 000	300 * 100 000 + 1 057 000 = 31 057 000
330	330 * 100 000 = 33 000 000	(330 – 302) * 100 000 –1 057 000 = 1 743 000	302 * 100 000 + 1 057 000 = 31 257 000



possible outcomes of EUR call option purchase at expiry compared to the exchange rate at expiry (importer)



outcome of EUR call option purchase at expiry as a hedging position compared to forward foreign exchange purchase (importer)

The chart illustrates the possible financial outcomes; profit or loss of the transaction may be balanced out by the financial outcome of the underlying exposure. The evolution of the historical exchange rate on the chart only intends to show a comparison between the level(s) of the transaction and the exchange rates prevailing in the past. Future evolution of the exchange rate and exchange rate fluctuations until maturity are unknown in advance, extent of profit or loss depends on the exchange rate level upon expiry. Number of possible outcomes is infinite and there may be even more extreme values than the ones presented below. The chart is not suitable to forecast the market value of the position during the tenor.

advantages of transaction

- full protection against a potential depreciation of the forint
- you can benefit from favourable exchange rate movements completely
- limited potential loss, with the option premium as maximum
- the maximum value of the HUF cash flow can be planned with certainty
- given a specific tenor and nominal value, the option premium and the strike rate can be tailored to your expectations, plans and budget. Changing a parameter entails change in the rest.
- the position can be closed with a counter deal (selling of EUR call option), at any time before the expiry date, resulting in an income for your company, because an option never has a negative value

risks of transaction

- the option premium must be paid on the trade date
- if the strike rate is the same as the forward rate, the profit threshold of the option is worse (taking into account the option premium) than the forward rate. Due to the option premium the company realises the exchange rate of a regular forward deal at a lower exchange rate upon expiry (forward – premium).
- closing the position before the expiry date may cause a loss if the option premium received upon the time of closing is less than what was charged as a premium when the option was bought
- the market value of options 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, the number of days remaining until the expiry of the transaction, and 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.
- 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 built up of one single plain vanilla option. The section on plain vanilla options of Chapter I/c. entitled "5 Basic Products" of "K&H Treasury Handbook of Market Risk Management" also applies to this product.

3.b. obligation to buy foreign currency (selling of EUR put option)

product description

By selling a EUR put option, your company acquires an obligation to buy foreign currency on a specific delivery date and at a specific strike rate, both set in advance, provided that on the expiry date the spot market rate is below the strike rate . An option obligation is like a forward deal in the event of the possible depreciation of the forint, in that the client must buy foreign currency at the rate fixed in advance.

If on the expiry date the spot rate is above the strike rate, your company will have neither a right nor an obligation. In contrast to a forward deal then, the selling of a EUR put option will not give you protection against the depreciation of the forint. The seller of the option receives an option premium upon the trade date.

Costs and revenues of the underlying exposure can compensate both the potential gains and losses of the deal, as long as the company assesses its underlying exposure and market situation properly. The deals are made in order to stabilize the results, not to realise standalone financial gain.

example: a Hungarian importer expects to incur, a year from now EUR 100 000 in expenses. Let us assume that the current spot exchange rate is 290 EUR/HUF, and the one-year forward rate is 302 EUR/HUF. Because buying this amount at an extremely high exchange rate will not have a significant impact on the company's profits, and neither will it cause a problem if the forint is appreciated by a large extent and the conversion takes place at the forward rate, the company sells a EUR put option with a strike rate equalling the forward exchange rate, that is, at 302 EUR/HUF.

In return for this obligation, the company receives an option premium on the trade date. The premium due for the obligation to buy foreign currency is 3.50% of the notional, or else 302 * 3.50% = 10.57 HUF per EUR, paid to the client when the deal is concluded.

Taking into account the option premium received, the company will realise an exchange rate equalling the standard forward if on the expiry date the EUR/HUF spot rate is (302 + 10.15 =) 312.15. (In this example we ignored that the premium should carry interest as well.

By selling an option a company cannot hedge its underlying exposure! According to our rules and policy at the time when this Handbook is edited, concluding this deal on a standalone basis is not allowed, only with a combination of buying an option.

parameters of the option deal – selling of EUR put option	
notional amount	EUR 100 000
currency pair	EUR/HUF
tenor	1 year
expiry date (date of exchange rate monitoring)	2 business days before end of tenor
exchange rate monitoring	EUR/HUF spot rate at 12:00 p.m. (CET) on the expiry date
settlement date	end of tenor
spot rate prevailing at pricing	290 EUR/HUF
forward rate prevailing at pricing	302 EUR/HUF
ATMF volatility	15%
strike rate	302 EUR/HUF
option premium (received by the client on the trade date)	3.50% * notional amount = 10.57 HUF for each EUR (1 057 000 HUF)
possible scenarios on expiry depending on the spot market rates at 12:00 p.m. on the expiry date	
exchange rate is below 302 EUR/HUF	Your company has an obligation to buy euros, since the option is exercised. Your company buys EUR 100 000 at a rate of 302 EUR/HUF.
exchange rate is at or above 302 EUR/HUF	Your company has neither a right nor an obligation, since the option is not exercised. Your company can buy euros at the spot rate prevailing on expiry.
best-case scenario (treasury transaction on a standalone basis)	The EUR/HUF spot rate is above 302 on the expiry date. Your company has neither a right nor an obligation. In this case, your company can buy euros at the spot rate prevailing on expiry (above 302 EUR/HUF).
worst-case scenario (treasury transaction on a standalone basis)	The EUR/HUF spot rate is below 302 on the expiry date. In this case, your company has an obligation to buy euros. Your company buys EUR 100 000 at a rate of 302 EUR/HUF. The resulting foreign exchange loss can be unlimited.

the market value of the position 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(the deal can be closed with profit if the market value is positive)

(assumption: except for the spot market rate, all other factors are unchanged)

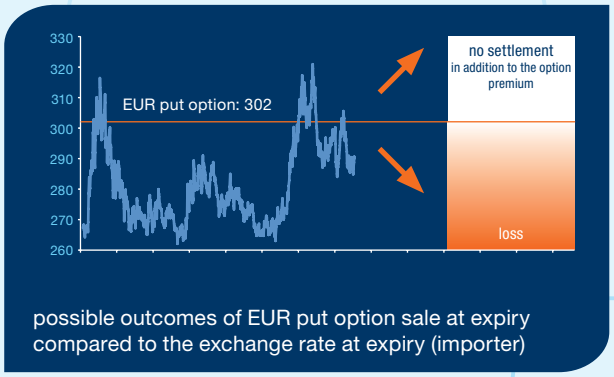
The number of possible outcomes is unlimited, and there may be even more extreme values than the ones presented below.

spot rate in two weeks (EUR/HUF)	market value of the position (HUF)
270	8.38 HUF per EUR * notional amount = - 838 000 HUF
300	2.24 HUF per EUR * notional amount = - 224 000 HUF
330	0.38 HUF per EUR * notional amount = - 38 000 HUF

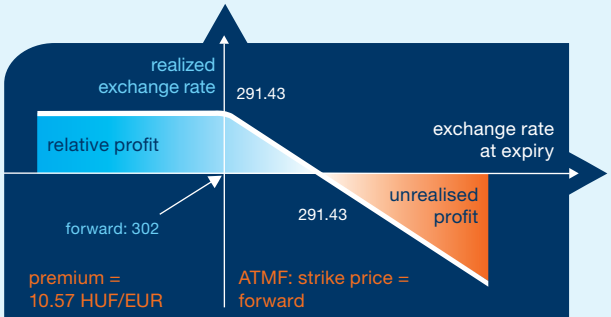
financial outcome of some possible scenarios on the expiry date

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

exchange rate on the expiry date (EUR/HUF)	underlying exposure's financial outcome with no treasury transaction (HUF)	profit / loss of the product on a standalone basis (HUF)	underlying exposure's financial outcome with the treasury transaction (HUF)
270	270 * 100 000 = 27 000 000	(270 – 302) * 100 000 + 1 057 000 = - 2 143 000	302 * 100 000 – 1 057 000 = 29 143 000
300	300 * 100 000 = 30 000 000	(300 – 302) * 100 000 + 1 057 000 = 857 000	302 * 100 000 – 1 057 000 = 29 143 000
330	330 * 100 000 = 33 000 000	0 + 1 057 000 = 1 057 000	330 * 100 000 – 1 057 000 = 31 943 000



possible outcomes of EUR put option sale at expiry compared to the exchange rate at expiry (importer)



outcome of EUR put option purchase at expiry as a hedging position compared to forward foreign exchange purchase (importer)

The chart illustrates the possible financial outcomes; profit or loss of the transaction may be balanced out by the financial outcome of the underlying exposure. The evolution of the historical exchange rate on the chart only intends to show a comparison between the level(s) of the transaction and the exchange rates prevailing in the past. Future evolution of the exchange rate and exchange rate fluctuations until maturity are unknown in advance, extent of profit or loss depends on the exchange rate level upon expiry. Number of possible outcomes is infinite and there may be even more extreme values than the ones presented below. The chart is not suitable to forecast the market value of the position during the tenor.

advantages of transaction

- if the strike rate is the same as the forward rate, the profit threshold of the option is more advantageous (after the reduction of the option premium) than a forward deal. Due to the option premium the company realises the exchange rate of a regular forward deal at a higher exchange rate upon expiry (forward + premium).
- the company receives an option premium on the trade date
- the option premium and the strike rate, with a given tenor and notional amount, can be tailored to your expectations, plans and budget. Changing a parameter entails change in the rest.
- the position can be closed with a counter deal (buying of EUR put option), at any time before the expiry date, but this will always come at a cost for your company, because an option never has a negative value

risks of transaction

- no protection against a potential depreciation of the forint
- this transaction does not allow you to benefit from a potential appreciation of the forint
- unlimited foreign exchange loss potential
- closing the position before the expiry date may cause a loss if the option premium paid upon the time of closing is more than what was received when the option was sold
- The market value of options 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, the number of days remaining until the expiry of the transaction, and 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

This product is built up of one single plain vanilla option. The section on plain vanilla options of Chapter I/c. entitled "5 Basic Products" of "K&H Treasury Handbook of Market Risk Management" also applies to this product.

connection between options and forward deals

Assuming identical terms and notional amounts, a forward deal can be constructed out of two options. To achieve this, the strike rates of the options must be the same as the forward rate (in this case 302), and the company must buy one option and sell the other. (See chapter II. of the "K&H Treasury Handbook of Market Risk Management Handbook" on forward deals and options). In such a case, on the trade date the cost of buying one option is the same as the income derived from selling the other, which means that the overall cost of the two deals is zero, just as in the case of a forward transaction.

buying foreign currency:
forward deal for buying foreign currency = buying of EUR call option + selling of EUR put option
(where strike rate = forward rate)

	options		forward
deal type	buying of EUR call option	selling of EUR put option	forward FX buying
right or obligation acquired upon concluding the deal	conditional right to buy EUR	conditional obligation to buy EUR	right and obligation to buy EUR
exchange rate	302.00 EUR/HUF (= forward rate = strike rate)		
condition	exchange rate on expiry > 302.00	exchange rate on expiry < 302.00	none
premium payable on trade date	- 1 057 000 (payable by client)	+ 1 057 000 (received by client)	0
total cost on trade date	0		0
spot rate on the expiry date is below forward rate	right does not become effective	**obligation becomes effective**	obligation becomes effective
spot rate on the expiry date is above forward rate	**right becomes effective**	obligation does not become effective	right becomes effective