

# Usage of Option Contracts for Foreign Exchange Risk Management

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**Abstract.** *Today in Romania, in the context of the liberalization of the capital account and under a floating exchange rate (official is a managed floating currency regime established by National Bank of Romania) the foreign exchange rate is very volatile. In consequence the financial institutions, corporations and, especially, the importers and exporters have to deal with a big exposition of currency risk related with their activities. Financial institutions and corporations today must adopt new roles in order to compete successfully in the explosively evolving foreign exchange markets. The methods, instruments and techniques used to manage foreign exchange risk are more complex than ever before.*

*The objective of our paper is to provide the techniques and insights needed to pinpoint opportunities and control risks. We will present the most modern practical methods for managing the currency risk: option strategies (spread, strangle, straddle, etc). Also we will present the advantage, the disadvantage and our opinions related with the use of currency derivatives instruments (especially currency strategies options), making a comparative analysis.*

**Key words:** foreign exchange rate; manage currency risk; currency derivatives (futures, options); currency option strategies (call, put, spread, straddle, strangle).

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## 1. Introduction

The deepening of globalization process has led to an increase in foreign exchange transactions in international financial markets. This has determined a higher volatility of exchange rates, and, implicitly, an increased foreign exchange risk.

There are many types of risks, but only few of them can bring losses as large as foreign exchange risk. In these conditions, the development of new modern and effective methods for managing foreign exchange risk becomes a great necessity for the players in international financial activity.

At the present, in Romanian economy the foreign exchange risk become more important than ever. The capital account liberalization<sup>(1)</sup> and the NBR's intent to intervene rarely in the forex market<sup>(2)</sup> have created the conditions for

bigger fluctuations of exchange rate. These fluctuations affect the activity of companies involved in international trade and the activity of banks holding assets and liabilities in different currencies. In conclusion, the capital account liberalization and the floating exchange regime enhance the risk of capital inflows and outflows.

Also, foreign exchange risk management is influenced by high volatility of EUR/USD quotations in international market and by reduced availability of hedging instruments in Romanian financial market. In order to increase the effectiveness of foreign exchange risk management Romanian specialists are interested in adopting instruments, indicators, methods, and techniques used in international practice.

International practice consecrated a wide range of instruments, indicators, methods, and techniques to identify, measure and hedge foreign exchange risk, from the simplest and the less costly to the most complicated and the costliest, but with enhanced performances.

In this article we will discuss about the most modern methods to manage (to hedge) the foreign exchange risk: currency options.

The essence of hedging is to transfer risk from the firm, that is exposed to risk but which would rather not be, to that which is not exposed, but which assumes some exposure to risk for some fee (Jacque, 1996). From the mid-80s the use of financial derivatives became widespread, especially among large companies in countries with developed financial markets. However, some authors (Mallin, Ow-Yong, Reynolds, 2001) admit that still there is a shortage of information about foreign exchange risk management (hedging) through derivatives.

There are two main types of hedging: internal and external. Internal hedging minimizes the amount of currency bought or sold in foreign exchange transactions. This can be achieved by appropriate pricing (in domestic currency, for example) by leading and lagging receipts and payments to match currency inflows and outflows, and by netting remaining currency receipts and liabilities (Bennett, p.70). Internal analysis allows the firm to reduce foreign exchange exposure using its own resources. External hedging uses foreign exchange hedging instruments. Most popular ones are forward and futures contracts, swaps and options.

## 2. Use of option strategies for managing the currency risk

The decisions to assume some risks and to avoid others, the option to use some management instruments and not to use the others bring the success or failure of a management team in a corporate or financial institution. Fluctuations in foreign exchange rates can have a major impact on a company's financial results, but with a more dynamic financial management approach, these risks can be reduced and the yields improved. The methods, instruments and techniques used to manage foreign exchange risk are more complex than ever before. The *financial derivative products* (options and futures contracts) are the most modern instruments for managing market risk (foreign exchange risk, interest rate risk, stock price risk). They are instruments that change the cash flows of a portfolio. This transformation of cash flows alters fluctuations in the market value of a portfolio. Among the wide range of modern instruments used to manage foreign exchange risk, we focus in this paper on currency options.

*Currency options* are one of the best ways for corporations or individuals to hedge against adverse

movements in exchange rates. The simplest type of currency options are: *CALL and PUT*. One of the attractions of options is that they can be used to create a *very wide range of payoff patterns* (referred as strategies options like: strangles, straddles, spreads, back spreads, butterfly, condor, etc.).

Using options and futures, whether separately or in combination, can offer countless trading opportunities. Whether the contents will prove to be the best strategies and follow-up steps will depend on the knowledge of the market, the risk-carrying ability and trading objectives.

For to be very efficiently in the market is necessary to follow some simple steps<sup>(3)</sup>:

*First: Determine the Market Outlook.*

That means to establish if are we generally bullish, bearish, or undecided on future market moves?

*Second: Determine the Volatility Outlook.*

That means to establish do we feel that volatility will rise, fall, or are you undecided?

*Third: Determine the "Best" Strike Price.*

By analyzing the market and volatility outlook further we should be able to select the option strike that provides the best opportunity. We can do this by calculating a few "What-If" scenarios.

*The fourth:* we must also consider margin requirements, commission costs, taxes and execution costs, as well as other possible factors.

*The fifth:* we may be able to transform a trade with just one transaction, the resulting position can contain options at strikes that may or may not be appropriate for your new outlook.

On the next table – there are suggesting strategies to use when "Initiating a Market Position." For use strategies options, in Table 1 is necessary we Look Up the Corresponding Strategy whether we are initiating a position or trying to follow up a current position, line up the correct row and column on the proper table to find a strategy that will help us make the most of our outlook.

**Initiating a market position**

Table 1

Market type	Bullish	Bearish	Undecided
<b>Volatility rising</b>	- Long Call - Call Ratio Backspread	- Long Put - Put Ratio Backspread	- Long - Streaddle - Long Strangle
<b>Volatility falling</b>	- Short Put - Call Ratio Spread	- Short Call - Put Ratio Spread	- Short - Streaddle - Short Strangle
<b>Volatility undecided</b>	Long Futures - Bull Spread	- Short Futures - Bear Spread	- Box / Conversion

**Source:** Chicago Mercantile Exchange, Strategy Futures & Options Guide, 2004.

From multiple strategies options used by companies or financial institutions, in this paper we will present:

A) Simple type currency options:

A.1) CALL

A.2) PUT

- B) Ones of the most used strategies options in forex market:
- B.1) SPREAD (BULL SPREAD and BEAR SPREAD)
  - B.2) COMBINATION (STRADDLE, STRANGLE, STRIP and STRAPS)

Currency Option is a “contract giving the right, not the obligation, to buy or sell a specific quantity of one foreign currency in exchange for another at a fixed price; called the Exercise Price or Strike Price. The buyer of a currency option pays a premium to the seller. There are two types of option expirations - American-style and European-style. American-style options are exercisable on any date up to the contract expiration date; in contrast, European style options only can be exercised at specific future dates.”(www. <http://en.wikipedia.org>)

Currency options may be quoted in one of two ways: American-terms, in which a currency is quoted in terms of the US dollar per unit of foreign currency; and European-terms (inverse terms), in which the dollar is quoted in terms of units of foreign currency per dollar. The same logic can be applied to currency pairs in which the US dollar is not one of the currencies. Either currency can be expressed in terms of the other.

Example: Suppose a Suisse manufacturing firm is expecting to be paid \$200,000 for a piece of electronic equipment to be delivered in 90 days. If the exchange rate goes down over the next 90 days the Suisse firm will lose money, but if the rate goes up then the Suisse firm will make a profit. The firm can purchase an option (the right to sell part or all of their expected income for Suisse franc at a given rate near today’s rate) to mitigate their risk of exchange rate fluctuation over the 90 days. Conversely another party may wish to have the reverse option for a similar reason. A market maker will buy and sell these options with the aim of making a profit while not incurring too much risk.

A) simple type currency options

A.1) CALL

A.2) PUT

There are two types of options from the point of view of the rights that convey:

A.1) *Currency CALL*: An option which gives the option buyer the right to purchase (go long) a particular currency at a specific rate. If the buyer exercises the call option, he will acquire a long currency position and someone who has sold an option will be assigned a short currency position at the same time.

A.2) *Currency PUT*: An option which gives the option buyer the right to sell (go short) a currency and someone who has sold an option will be assigned a long currency position at the same time.

These types of strategies are illustrated in Figure 1.

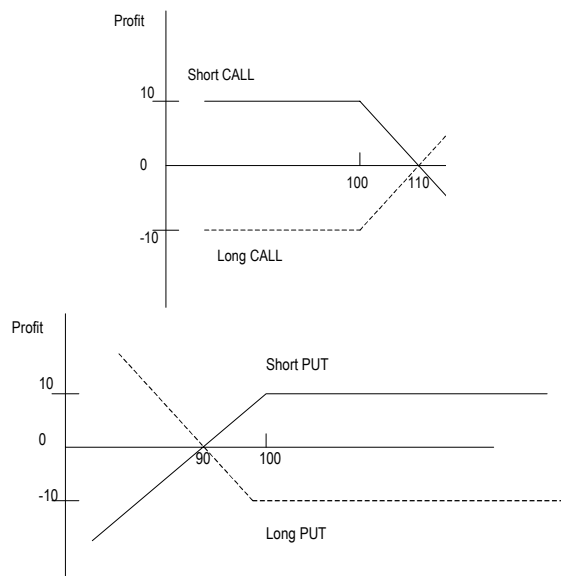


Figure 1. The symple type currency strategies

We use these strategies options in following situations like in table no.2

Strategies used in simple type currency options

	CALL	PUT
<b>LONG</b>	Increase anticipation of currency	Decrease anticipation of currency
<b>SHORT</b>	Decrease anticipation of currency	Increase anticipation of currency

Source: www. learnmoney.com

What does each of the option types of trades do for our position? The tables no. 3 and 4 give us the answers.

Risc profile

RISK	FORWARDS		CALLS		PUTS	
	Attitude	RISK	Attitude	RISK	Attitude	RISK
BOUGHT	BULLISH	HIGH	BULLISH	LOW	BEARISH	LOW
SOLD	BEARISH	HIGH	BEARISH	HIGH	BULLISH	HIGH

Limitations

LIMITATIONS	BOUGHT	SOLD
PROFIT	UNLIMITED	LIMITED
LOSS	LIMITED	UNLIMITED

In every foreign exchange transaction, one currency is purchased and another currency is sold. Consequently, every currency option is both a call and a put. An option to buy Australian dollars against United States dollars is both an Australian dollar call and a United States dollar put. Conversely, an option to sell Australian dollars against United States dollars is an Australian dollar put and United States dollar call. The advantage of the options is that they can be combined and result o lot of number of strategies options which can offer a better protection and many choises for rising investors’ benefits.

B) the most used strategies options in forex market:

SPREAD (BULL SPREAD and BEAR SPREAD)

COMBINATION (STRADDLE, STRANGLE, STRIP and STRAPS)

**B.1) SPREAD**

A spread is an option trading strategy that involves taking a position in two or more options of the same type (example two or more calls or two or more puts).

Spread option trading strategies can be created with either all calls or all puts, and be bullish or bearish.

A family of currency spreads involving:

- options of the same currency,
- same expiration month,
- different strike prices.

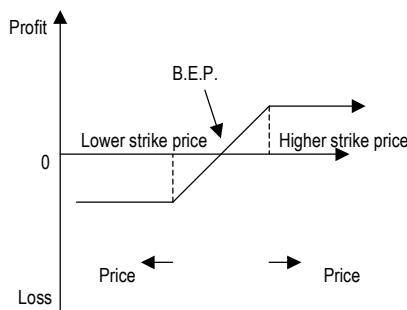
The call with the lower strike price will always be purchased at a price greater than the offsetting premium received from writing the call with the higher strike price.

The put with the higher strike price will always be purchased at a price greater than the offsetting premium received from writing the put with the lower strike price.

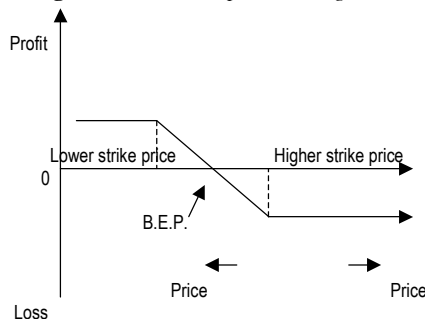
**B.1.1) BULL SPREAD** is one of the most popular type of spread and it can be created by:

- buying a call option on a currency *with a certain strike price* ( $E_1$ ) and
- selling a call option on the same currency with a higher strike price ( $E_2$ )
- both options have the same expiration date
- price of purchased call option ( $C_1$ ) is higher than price of writing call ( $C_2$ ).

Both the buy and the sell sides of this spread are opening transactions, and are always the same number of contracts. *This is a BULL CALL SPREAD.* The strategy is illustrated in Figure 2.



**Figure 2.** Bull Call Spread Strategies



**Figure 3.** Bear Put Spread Strategies

Suppose that the  $E_1$  is the strike price of the call bought,  $E_2$  is the strike price of the call option sold and  $S$  is the price on the expiration date of the options. The Table 5 shows the total payoff that will be realized from bull spread in different circumstances.

**Option strategies circumstances**

Table 5			
PAYOFF din BULL SPREAD			
Currency Price Range	Payoff from Long Call Options	Payoff from Short Call Options	Total Payoff
$S \leq E_1$	0	0	0
$E_1 < S < E_2$	$S - E_1$	0	$S - E_1$
$S \geq E_2$	$S - E_1$	$E_2 - S$	$E_2 - E_1$

The profit from the whole strategy is the sum of the profits given by the call options and is indicated by the solid line. The profit in figure 2 is calculated by subtracting the initial investment (Net Debit Paid) from payoff.

*The maximum profit* for this spread will generally occur as the underlying currency price rises above the higher strike price, and both options expire in-the-money. The investor can exercise the long call, buy currency at its lower strike price, and sell that currency at the written call's higher strike price if assigned an exercise notice. This will be the case no matter how high the underlying stock has risen in price.

*Maximum loss* for this spread will generally occur as the underlying currency price declines below the lower strike price. If both options expire out-of-the-money with no value, the entire net debit paid for the spread will be lost.

**BULL SPREAD** can also be created by:

- buying a put option with a low strike price ( $E_1$ ) and
- selling a put with a high strike price ( $E_2$ ).

This is a bull put spread. Unlike the bull call spread, bull put spread involve a positive cash flow to the trader up front (ignoring margin requirements) and a payoff that is either negative or zero.

**B.1.2) BEAR SPREAD** can be created by:

- buying a put option on a currency with a certain strike price ( $E_2$ ) and
- selling a put option on the same currency with a lower strike price ( $E_1$ )
- both options have the same expiration date
- price of writing put option ( $C_1$ ) is lower than price of purchased put ( $C_2$ ).

Both the buy and the sell sides of this spread are opening transactions, and are always the same number of contracts. This is a bear put spread. The strategy is illustrated in Figure 3.

*The maximum profit* for this spread will generally occur as the underlying stock price declines below the lower strike price, and both options expire in-the-money. This will be the case no matter how low the underlying stock has declined in price.

*Maximum loss* for this spread will generally occur as underlying stock price rises above the higher strike price. If both options expire out-of-the-money with no value, the entire net debit paid for the spread will be lost.

**BEAR SPREAD** can also be created by:

- buying a call option with a high strike price ( $E_2$ ) and
- selling a call with a low strike price ( $E_1$ ).

A bear call spread involves an initial cash inflow (when margin requirements are ignored), because the price of call sold is greater than the price of the call purchased.

BEAR put SPREAD	
Construction	Short put X + Long put Y
Break-Even-Point (BEP)	Strike Price of Purchased Put - Net Debit Paid
Maximum profit	Limited to: Difference Between Strike Prices - Net Debit Paid
Maximum loss	Limited to: Net Debit Paid

Like bull spreads, bear spreads limit both the upside profit potential and the downside risk

### B.2) COMBINATION

A combination is an option trading strategy that involves taking a position in both calls and on the same underlying asset. The most used combinations are: straddles, strips, straps and strangles.

*B.2.1) STRADDLE* is one the most popular combination and it involves:

- buying a call and a put on the same currency;
- the same strike price (E);
- the some expiration date.

This is a long straddle strategy option.

In this way, an investor can take advantage of any sudden movement in the particular currency price regardless of direction. This strategy might be employed before earnings or FDA approval notice is about to be in the news.

The strategy is illustrated in Figure 4.

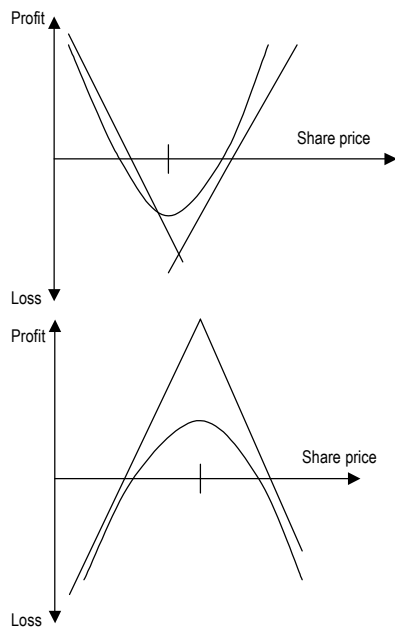


Figure 4. Long and Short Straddle Strategies

If the currency price is close to the strike price at expiration of the option, the long straddle leads to a loss. If there is a sufficiently large move in either direction, a significant profit will result.

Suppose that the E is the strike price of the call and put options and S is the price on the expiration date of the options. The Table 6 shows the total payoff that will be realized from straddle strategy.

### Stradde strategy payoff

Table 6

PAYOFF FROM A STRADDLE			
Currency Price Range	Payoff from Call	Payoff from Put	Total Payoff
$S \leq E$	0	E-S	E-S
$S > E$	S-E	0	S-E

A straddle is appropriate when a trader is expecting a large move in a currency price but doesn't know in which direction the move will be.

A short straddle or top straddle or straddle write is the reverse position of long straddle or bottom straddle or straddle purchase. A short straddle is created by:

- selling a call and a put on the same currency;
- the same exercise price;
- the same expiration date.

It is a highly risky strategy. If the price of the expiration date is close to the strike price, a significant profit results. However, the loss arising from a large move in either direction is unlimited.

*B.2.2) STRANGLE* (called sometimes bottom vertical combination) is created by:

- buying a call and a put a on the same currency;
- the different strike price;
- the some expiration date;
- the call strike price ( $E_2$ ) is higher than the put strike price ( $E_1$ ).

This is a long strangle strategy option.

A strangle is a similar strategy to a straddle. The trader is betting that there will be a large price move but is uncertain whether it will be an increase or decrease. The currency price has to move farther in a strangle strategy than in a straddle for the trader to make a profit. However, the downside risk if the currency price ends up at a central value is less with a strangle.

The strategy is illustrated in Figure 5.

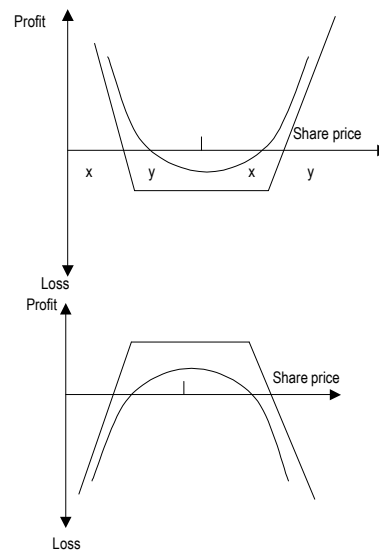


Figure 5. Long and Short Strangle Strategies

Suppose that the  $E_1$  is the strike price of the put,  $E_2$  is the strike price of the call option and S is the price on the expiration date of the options. The Table 7 shows the total payoff that will be realized from strangle strategy.



## Strangle strategie payoff

Table 7

PAYOFF FROM A STRANGLE			
Currency Price Range	Payoff from Call	Payoff from Put	Total Payoff
$S \leq E_1$	0	$E_1 - S$	$E_1 - S$
$E_1 < S < E_2$	0	0	0
$S \geq E_2$	$S - E_2$	0	$S - E_2$

Strangles may be appropriate strategies when an investor believes that a currency is likely to make a substantial move in either direction. While the long strangle has theoretically unlimited potential and limited risk, it should not be viewed as a low risk strategy. Options can lose their value very quickly, and in the case of a strangle, there is a substantial amount of erosion of time value as compared to the purchase of a put or call.

The opposite of a long strangle is the short strangle (top vertical combination).

The short strangle is created by:

- selling a call and a put on the same currency;
- the different strike price;
- the same expiration date;
- the call strike price ( $E_2$ ) is higher than the put strike price ( $E_1$ ).

The short strangle can be appropriate for a trader who feels that large stock price moves are unlikely. However, like the sale of straddle, it is a strategy involving unlimited potential loss to the trader.

## B.2.3) STRIPS and STRAPS

STRIPS	STRAPS
- 1 Long CALL +	- 1 Long PUT +
- 2 Long PUT	- 2 Long CALL
- the same exercise price	- the same exercise price
- the same date of payment	- the same date of payment

## Notes

- (1) Starting 1<sup>st</sup> September 2006, the foreigner investors have had access to T-bills issued by Romanian government. In the past, they could buy T-bills only with NBR's authorization that imposed restrictions. The NBR's restrictions aimed to avoid shocks in foreign exchange market. At present, the lack of NBR's restrictions contributes to the increase in probability that shocks incur in

## 3. Conclusions

Today, the methods, instruments and techniques used to manage foreign exchange risk are more complex than ever before.

Among the most modern practical methods for managing the currency risk the use of financial derivative instruments (currency swap, forward, futures and options) in the rising value of companies and financial institutions.

In Romanian market, the derivatives are traded on Romanian Commodity Exchange from Bucharest and Financial-Monetary Commodity Exchange from Sibiu.

More, as a result of capital account liberalization, traders can perform transactions with derivatives on international markets where the liquidity is thousands times greater than liquidity in domestic market.

The foreign exchange risk will exist even after the EMU accession (the main currencies traded are EUR, USD, JPY and yuan).

In our opinion, the volatility in forex markets is going to increase as the globalization process deepens. The foreign exchange risk will disappear only when a single currency will be used around the world, if this ever happen.

We consider that the following elements must be taken into consideration to improve the quality of exchange rates forecasts:

- "hot money" inflows/outflows in conditions of capital account liberalization
- disinflation policy adopted by NBR
- current account deficit
- remittances from Romanians working abroad
- monetary policy of FED and European Central Bank.

foreign exchange market with negative impact on the activity of institutions which use foreign currency ([www.bnro.ro](http://www.bnro.ro))

- (2) NBR maintains a controlled floating exchange rate for RON; NBR is not yet prepared for a free exchange rate regime because of current account deficit and risk of "hot money" inflow.
- (3) Chicago Mercantile Exchange, Strategy Futures & Options Guide, 2004 ([www.cme.com](http://www.cme.com))

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