

Currency Options in Function of Currency Risk Hedging and Speculating

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UDC: 339.743(497.1) JEL: G18

***ABSTRACT** – Due to current monetary policy of National Bank of Serbia which is focused on targeting the inflation rate, and therefore the introduction of a flexible foreign exchange rate policy which includes foreign exchange rate fluctuations, there is need for transactions performed in foreign currencies to be ensured from unpredictability of foreign exchange rate movements. This is related not only to transactions but also to property that is denominated in foreign currency. Serbia is a country in the advanced transition becoming more open to other markets, which requires the use of all more sophisticated financial instruments in business to reduce the risk due to the unpredictability of market. Mechanism that is used in the function of reducing the risk of foreign exchange rate in the financial markets of developed countries is currency hedging. A currency derivative is the contract whose price is partially derived from the value of the underlying currency that it represents. Some individuals, corporations and financial institutions take position in currency derivatives to hedge or speculate on future foreign exchange rate movements. Currency options provide the right to purchase or sell currencies at specified prices. The specific objective of this text is to explain how currency option contracts are used to speculate or hedge based on anticipated foreign exchange rate movement.*

Introduction

Currency options provide the right to purchase or sell currencies at specified prices. They are available for many currencies, including the U.S. dollar, British pound, Brazilian real, Canadian dollar, euro, Japanese yen, Mexican peso, etc.

In late, exchanges in Amsterdam, Montreal and Philadelphia first allowed trading in standardized foreign currency options. Since that time, options have been offered on the Chicago Mercantile Exchange and the Chicago Board Options Exchange. In addition to the Exchange where currency options are available, there is an over-the-counter market where currency options are offered by commercial banks and brokerage firms. Unlike the currency options traded on an exchange, the over-the-counter market offers currency options that are tailored to the specific needs of the firm. Since these options are not standardized, all the terms must be specified in the contracts. The number of units, desired strike price, and expiration date can be tailored to the specific needs of the client. When currency options are not standardized, there is less liquidity and wider bid/ask spread. Currency options are classified as either calls or puts, as discussed in the next section.

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Currency call options

A currency call options grants the right to buy a specific currency at a designed price within a specific period of time. The price at which the owner is allowed to by that currency is known as the *exercise price (strike price)*, and there are monthly expiration dates for each option.

Call option are desirable when one wishes to lock in a maximum price to be paid for a currency in the future. If the spot rate of the currency rises above the strike price, owners of call options can “exercise” their options by purchasing the currency at the strike price, which will be cheaper than the prevailing spot rate. The owner can choose to let the option expire on the expiration date without ever exercising it. Owners of expired call options will have lost the premium they initially paid, but that is the most they can lose. The premium on a call option represents the cost of having the right to buy underlying currency at a specified price. For multinational companies that use currency call options to hedge, the premium reflects a cost of insurance or protection to the multinational companies. The call option premium is primarily influenced by three factors: the difference between the spot exchange rate, the strike or exercise price, the time to maturity, and the volatility of the currency.

Hedging with currency call options

Corporations with open positions in foreign currencies can sometimes use currency call options to cover next positions: hedge payables, project and target bidding and speculating.

Multinational companies can purchase call options on a currency *to hedge future payables*.

Example: When Serbian importer orders European union goods, it makes a payment in euros (EUR) to the exporter upon delivery. An euro call option locks in a maximum rate at which importer can exchange serbian dinar (RSD) for euros. This exchange of currencies at the specified strike price on the call option contract can be executed at any time before the expiration date. In essence, the call option contract specifies the maximum price that importer must pay to obtain these EU imports. If the euros value remains below the strike price, importer can purchase euros at the prevailing spot rate when it needs to pay for its imports and simply let its call option expire. Used – based multinational companies that *bid for foreign projects* may purchase call options to lock in the dinar cost of the potential expenses.

Example: Serbian company that is bid on a project sponsored by the EU. If the bid is accepted, company will need approximately EUR 500,000 to purchase EU materials and services. However, company will not know whether the bid is accepted until 3 months from now. In this case, it can purchase call options with a 3-month expiration date. Ten call option contracts will cover the entire amount of potential exposure. If the bid is accepted, company will likely let the options expire.

Assume that the exercise price on EUR is RSD100 and the call option premium is RSD0.02 per unit. Company will pay RSD1000 per option (50,000 units per euro option), or RSD10,000 for the 10 option contracts. With the options, the maximum amount necessary. The amount of dinars needed would be less if the euros spot rate were below the exercise price at the time the euro were purchased.



Even if company's bid is rejected, it will exercise the currency call option if the euro spot rate exceeds the exercise price before the option expires and would then sell the euro in the spot market. Any gain from exercising may partially or even fully offset the premium paid for the options.

Firms can also use call options to hedge a *possible acquisition*.

Example: U.S. multinational company is attempting to acquire a Serbian company and has submitted its bid in euros. U.S. company has purchased call options on the euro because it will need euros to purchase the Serbian company's stock. The call options hedge the U.S. company against the potential appreciation of the euro by the time the acquisition occurs. If the acquisition does not occur and the spot rate of the euro remains below the strike price, U.S. company can let the call options expire. If the acquisition does not occur and the spot rate of the euro exceeds the strike price, U.S. company can exercise the options and sell the euros in the spot market. Alternatively, U.S. company can sell the call options it is holding. Either of these actions may offset part or all of the premium paid for this options.

Speculating with currency call options

Individuals may speculate in the currency options market based on their expectation on the future movements in a particular currency. Speculators who expect that a foreign currency will appreciate can purchase call options on that currency. Once the spot rate of the currency appreciates, the speculators can exercise their options by purchasing that currency at the strike price and then sell the currency at the prevailing spot rate.

A seller (writer) of a call option is obligated to sell a specified currency at a specified price (the strike price) up to a specified expiration date. Speculators may sometimes want to sell a currency call option on a currency that they expect will depreciate in the future. The only way a currency call option will be exercised is if the spot rate is higher than the strike price. Thus, a seller of a currency call option will receive the premium when the option is purchased and can keep the entire amount if the option is not exercised. When it appears that an option will be exercised at some point. The net profit to a speculator who trades call options on a currency is based on a comparison of the selling price of the currency and the premium paid for the call option.

Example: Henkel AD is a speculator who buys a British pound call option with a strike price of RSD116.52 at a December settlement date. The current spot price as of that date is about RSD116.10. Henkel pays a premium of RSD0.01 per unit for the call option. Assume there are no brokerage fees. Just before the expiration date, the spot rate of the British pound reaches RSD116.55. At this time, Henkel AD exercise the call option and immediately sells the pounds at the spot rate to bank. To determine his profit or loss, first compute his revenues from selling the currency. Then, subtract from this amount the purchase price of pounds when exercise the option, and also subtract the purchase price of the option.

| | Per Unit (RSD) | Per Contract (RSD) |
|-----------------------|----------------|---------------------------------|
| Selling price of £ | 116.59 | 1,165,590 (116.59 × 1000 units) |
| - Purchase price of £ | -116.52 | -1,165,520 (116.52 × 1000 unit) |
| - Premium | -0.10 | -100 (-0.10 × 1000 units) |
| = Net profit | -0.03 | - 30 (-0.03 × 1000 units) |



Assume that Aikbanka AD was the seller of the call option purchased by Henkel AD. Also assume that Aikbanka would purchase British pound only if and when the option was exercised, at which time she must provide the pounds at the exercise price of RSD116.50. Using the information in this example, Aikbanka's net profit from selling the call option is derived here:

| | Per Unit RSD | Per Contract (RSD) |
|-----------------------|--------------|--------------------------------|
| Selling price of £ | 116.59 | 116,559 (116.59 x 1000 units) |
| - Purchase price of £ | -116.52 | -116,552 (116.52 x 1000 units) |
| - Premium | +0.10 | +100 (-0.10 x 1000 units) |
| = Net profit | +0.03 | + 30 (-0.03 x 1000 units) |

When brokerage fees are ignored, the currency call purchaser's gain will be the seller's loss. The currency call purchaser's expenses represent the seller's revenues, and the purchaser's revenues represent the seller's expenses. Yet, because it is possible for purchasers and sellers of options to close out their positions, the relationship described here will not hold unless both parties begin and close out their positions at the same time. The purchaser of a call option will break even if the revenue from selling the currency equals the payments for the currency (at the strike price) and the option premium.

In other words, regardless of the number of units in a contract, a purchaser will break even if the spot rate at which the currency is sold is equal to the strike price plus the option premium. Based on the information in the previous example, the strike price is RSD116.52 and the option premium is RSD0.10. Thus, for the purchaser to break even, the spot rate existing at the time the call is exercised must be RSD116.62 (116.52+0.10). Speculators will not purchase a call option if they think the spot rate will only reach the break-even point and not go higher before the expiration date.

Currency put options

The owner of a currency put option receives the right to sell a currency at a specified price (the strike price) within a specified period of time. As with currency call options the owner of a put option is not obligated to exercise the option. Therefore, the maximum potential loss to the owner of the put option is the price (or premium) paid for the option contract. The put option premium is primarily influenced by three factors: difference between the spot exchange rate, strike or exercise price, time to maturity and volatility of the currency, as measured by the standard deviation of the movements in the currency.

Hedging with currency put options

Corporations with open positions in foreign currencies can use currency put options in some cases to cover these positions.

Example: The company exports from Serbia to Germany in the value of the million that will be charged within three months. Current spot rate EUR/RSD is 77.56, while the forward rates at three months is 78.89. Value contract rates at the spot exchange rate is RSD 77.56 million.



If the exporter believes that the EUR will continue to strengthen, that is that the rates RSD continue to decline, most likely by 79.15, and if his expectations realized, the value of the contract will amount to 79.15 million RSD. To a profit of 1.59 million RSD than expected growth rate, should not undertake anything, but to wait than to happen. However, this problem may occur if you happen to weaken the EUR and RSD to strengthen the potential 77.00. He buys three – month put option to one million EUR to 78.50 price execution, or the right to one million EUR sold at a price of 78.50. Price of these options is 10%, ie. 0.1 point of the course.

For three months, RSD was the highest historical level against the EUR from 77.10, while the exporter automatically receives payment rates from 78.50 (one million EUR at the exchange rate 78.50) and thus achieves a bonus of 1.40 million RSD, or 1.4 dinars per EUR). Effective exchange rate for this option is 78.40, or total earnings relative to the current spot exchange rate for exporters in the business of 1.3 million RSD ($78.50 - 0.1 - 77.1 = 1.30$ dinar per EUR)

Speculating with currency put options

Individuals may speculate with currency put options based on their expectations of the future movements in a particular currency. For example, speculators who expect that the British pound will depreciate can purchase British pound put options, which will entitle them to sell British pounds at a specified strike price. If the pound's spot rate depreciates as expected, the speculators can then purchase pounds at the spot rate and exercise their put options by selling these pounds at the strike price. Speculators can also attempt to profit from selling currency put options. The seller of such options is obligated to purchase the specified currency at the strike price from the owner who exercises the put option. Speculators who believe the currency will appreciate (or at least will not depreciate) may sell a currency put option. If the currency appreciates over the entire period, the option will not be exercised. This is an ideal situation for put option sellers since they keep the premiums received when selling the options and bear no cost.

Speculating with combined put and call options

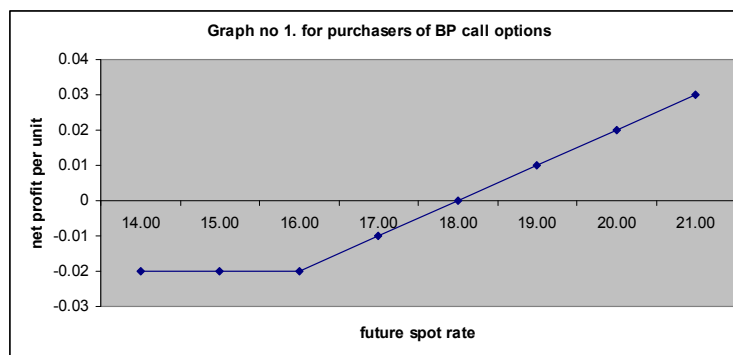
For volatile currencies, one possible speculative strategy is to create a straddle, which uses both a put option and a call option at the same exercise price. This may seem unusual because owning a put option is appropriate for expectations that the currency will appreciate. However, it is possible that the currency will depreciate (at which time the put is exercised) and then reverse direction and appreciate (allowing for profits when exercising the call). Also, a speculator might anticipate that a currency will be substantially affected by current economic events yet be uncertain of the exact way it will be affected. By purchasing a put option and a call option, the speculator will gain if the currency moves substantially in either direction. Although two options are purchased and only one is exercised, the gains could more than offset the costs.

Contingency graph for currency options

A contingency graph for currency illustrates the potential gain or loss for various exchange rate scenarios

A *Contingency graph for a purchaser of a call option* compares the price paid for the call option to potential payoffs to be received with various exchange rate scenarios.

Example: A British pound call option is available, with a strike price of RSD116,00 and a call premium of RSD0,02. The speculator plans to exercise the option on the expiration date and then immediately sell the pounds received in the spot market. Under these conditions, a contingency graph can be created to measure the profit or loss per unit (graph 1.). Notice that if the future spot rate is RSD116,00 or less, the net gain per unit is $-.02$ (ignoring transaction costs). This represents the loss of the premium per unit paid for the option, as the option would not be exercised. At RSD117,00, RSD.01 per unit would be earned by exercising the option, but considering the RSD.02 premium paid, the net gain would be $-RSD.01$. At RSD118,00, RSD.02 per unit would be earned by exercising the option, which would offset the RSD.02 premium per unit. This is the break-even point.



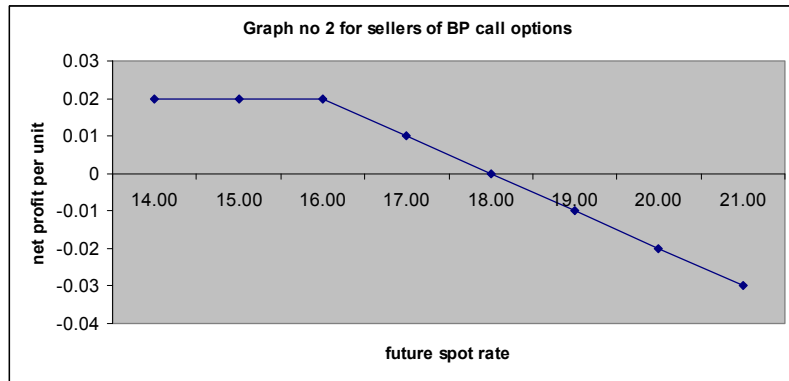
At any rate above this point, the gain from exercising the option would more than offset the premium, resulting in a positive net gain. The maximum loss to the speculator in this example is the premium paid for the option.

A *contingency graph for the seller of a call option* compares the premium received from selling a call option to the potential payoffs made to the buyer of the call option for various exchange rate scenarios.

Example: The graph 2. provides a contingency graph for a speculator who sold the call option described in the previous example. It assumes that this seller would purchase the pounds in the spot market just as the option was exercised (ignoring transaction costs). At future spot rates of less than RSD116,00, the net gain to the seller would be the premium of RSD.02 per unit, as the option would not have exercised. In the future spot rate is RSD117,00 the seller would lose RSD.01 per unit on the option transaction (paying RSD117,00 for pounds in the spot market and selling pounds for RSD116,00 to fulfill the exercise request). Yet, this loss would be more than offset by the premium of RSD.02 per unit received, resulting in a net gain RSD.01 per unit. The break-even point is at RSD118,00, and the net gain to the seller of a call option becomes negative at all future spot rates higher than that

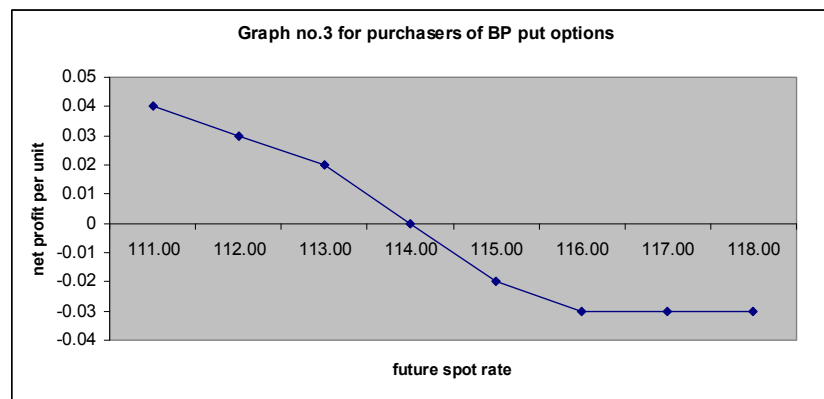


point. Notice that the contingency graph for the buyer and seller of this call option becomes negative at all future spot rates higher than that point. Notice that the contingency graphs for the buyer and seller of this call option are mirror images of one another.



A contingency graph for a buyer of a put option compares the premium paid for the put option to potential payoffs received for various exchange rate scenarios.

Example: The graph 3. shows the net gains to a buyer of a British pound put option with an exercise price of RSD 116.00 and a premium of RSD 0.03 per unit. If the future spot rate is above RSD 116.00, the option will not be exercised. At a future spot rate of RSD 115.00, the put option will be exercised. However, considering the premium of RSD.033 per unit, there will be a net loss of RSD.01 per unit. The break-even point in this example is RSD114.00, since this is the future spot rate that will generate RSD 0.03 per unit from exercising the option to offset the RSD0.03 premium. At any future spot rates of less than RSD114.00 the buyer of the put option will earn a positive net gain.

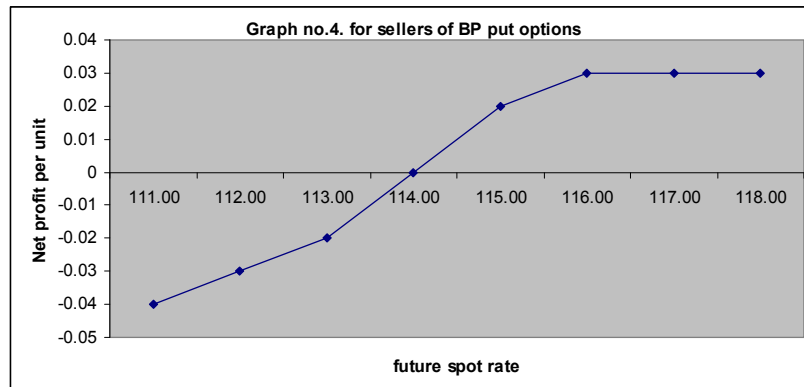


A Contingency graph for the seller of this put option compares the premium received from selling the option to the possible payoffs made to the buyer of the put option for various exchange rate scenarios. The graph 4. is like the mirror image of the contingency graph for the buyer of a put option.

For various reasons, an option buyer's net gain will not always represent an option seller's net loss. The buyer may be using call options to hedge a foreign currency, rather than to



speculate. In this case, the buyer does not evaluate the option position taken by measuring a net gain or loss; the option is used simply for protection. In addition, sellers of call options on a currency in which they currently maintain a position will not need to purchase the currency at the time an option is exercised.



Conclusion

Instruments of protection against exchange rate risk in our market are already available. Are simpler than it first appears and there is no need to wait passively until the date of payment or charges that would then also face the effects of market changes already implemented. For commercial banks and monetary regulators to continue in the direction of creating a good climate for further development of financial derivatives market. For potential customers, on the other hand, to recognize their interest in these instruments and their knowledge of the essence. Financial derivatives, in the case of currency options, through its internal mechanisms, the uncertainty of the future are reduced to a flat torque current and the known. This advantage, however, implies the responsibility of both parties to the contract of financial derivative that is a contracted until the end of respect, regardless of the actual outcome of maturity. It is at this point of financial derivatives to fully perform their function of "hedging" instruments and fully diverge with "crystal ball", which provides unpredictable and because of that in our country, there is still resistance and doubt about the usefulness of financial derivatives contracts. But once they removed the idea of extraordinary profit in the name of the price change that has occurred, and did not have to happen, and adopted the principle of "safety and responsibility towards themselves, shareholders, employees, financial derivatives market will become an instrument without which the and still can not.

**References**

- Apte. 2006. *International financial management*, Tata McGraw/Hill Education
- Geert Bekaert, Robert J. Hodrick. 2008. *International financial management*. New York: Pearson Prentice Hall
- Madura, Jeff.2010. *International financial management*. Abridged Edition.
- Suk H.Kim and Kim Seung H.2006. *Global Corporate Finance*. Oxford: Blackwell Publishing
- Thummuluri, Siddaiah.2010. *International financial management*. New York: Pearson Education
- Vyuptakesh, Sharan.2009. *International financial management*. New Delhi: PHI Learning Private Limited.
- Bourse de Montreal.2009."Currency Options." www.m-x.ca/f_publications_en/currency_options.pdf
- Finance-MapsofWorld.com "Currency Option trading."
"www.mapsofworld.com/option/trading/currency/html
- Investopedia "Currency Option." www.investopedia.com
- Wikipedia "Foreign Exchange Option." www.en.wikipedia.org/wiki/Foreign_exchange_option

Article history: Received: 12 March 2011
Accepted: 13 April 2011