

Selecting a Suitable Currency Options Hedging Strategy for Managing Foreign Exchange Risk

“Currency options” are derivative instruments that gives the buyer of this option the right but not the obligation to execute a specified transaction in the underlying currency pair. It gives the buyer the flexibility to execute settlement of option or not. This article focuses on the dynamics of hedging foreign exchange risk through currency options applications. The Currency options are one of the best tool available to hedge foreign exchange exposures in various foreign exchange market conditions, like volatile, stagnant, bullish, bearish.

Currency options are derivative instruments, which give buyer of the option the right but not the obligation to execute a specified transaction in the underlying currency pair. It gives the buyer the flexibility to execute settlement of option or not. These are different from other derivatives like forwards and futures in a way that it provides downside protection against risk and also an upside benefit from favourable movements in the underlying exchange rates.

Since the person has the right to buy or sell the foreign currency, but not the obligation, it can let the option expire by not exercising its right, in case the exchange rates move in its favour, thereby making the profits it would not have made had it hedged through currency forwards or currency futures.

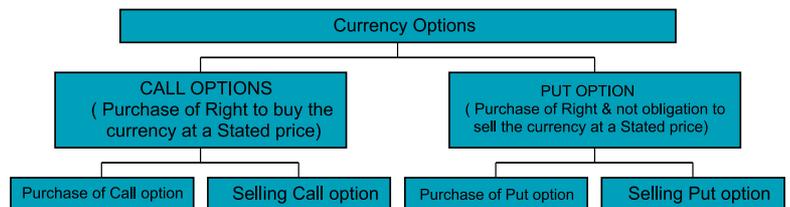
However, the above advantage does not come free because the above feature currency options generally cost more than other tools of hedging. The other advantage offered by options are flexibility in selecting the exchange rate at which a currency can be bought or sold unlike for forwards or futures in which there is only one exchange rate.



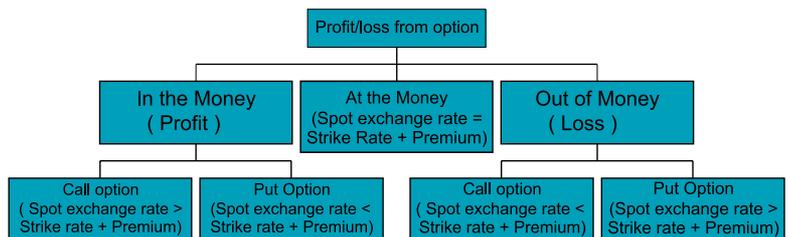
- CA. Gurvinder S. Gandhi

(The author is a Member of the Institute working as Manager Finance, Canon India Pvt. Ltd., Gurgaon. He can be reached at gurvinder.Gandhi@canon.co.in)

There are two types of Currency options i.e CALL & PUT as elucidated below.



Profit/loss from an option – The profit/loss arising from currency options under various circumstances are as under.



Option Pricing – Pay off from buying a Call option: It is maximum of (0, (Spot exchange rate – Strike rate))

Pay off from buying a Put option: It is maximum of (0, (Strike rate – Spot exchange rate))

Premium – Intrinsic and Extrinsic Value

The price of buying a currency option, i.e. premium has two components namely intrinsic value and extrinsic value, which is paid upfront

while executing an option transaction. Firstly, the premium includes any amount by which the option is 'In the Money' for

Call Premium = (Spot exchange rate – Strike rate), and

Put Premium = (Strike rate – Spot exchange rate) and this is known as 'Intrinsic value'.

The second component of the premium is 'Extrinsic value' which reflects all other factors that determine the price of an option, including time to expiration, the expected volatility of underlying currency, short term interest rates and inflation rates.

Factors Influencing Option Prices

Call premium = (Spot exchange rate – Strike rate)

Positive relationship between Call Premium & exchange rate, as exchange rate increases call premium also increases and Inverse relationship between call premium and strike rate as strike rate increases call premium decreases.

Put premium = (Strike rate – Spot exchange rate)

There is Positive relationship between put premium and strike rate, as strike rate increases, put premium also increases. And there is inverse relationship between put premium and exchange rate, as exchange rate increases put premium decrease.

Time to maturity: Call & Put options become more valuable as time to maturity increases, it is because of Risk as the time increases.

Volatility: As volatility increases there is high degree of uncertainty about the rate of the currency and hence on the option. The owner of the call benefits from the rate increase and that of the put benefits from the rate decreases.

Risk free Interest Rate: The Interest rate differential between the underlying currency pairs used to derive the FX Forward rate and therefore has an impact on the option price. As the Interest rate in the economy increases, value

of Call option increases and value of Put option decreases.

Treasury and Risk manager may undertake following steps before booking currency option contracts:

- Calculation of Foreign exchange exposure value and period for which options covers to be taken.
- Measurement of Hedge ratio and degree of risk acceptable to management.
- Invitation of currency option quotes from various Banks.
- Expectations and Keeping track of exchange rate movements.
- Evaluation and cost benefit analysis of Currency option quotes with spot rate and forward rates.
- Booking of option contracts with Bank.

Need for Suitable Currency Option Hedging Strategy

Indian rupee has witnessed considerable volatility against USD since beginning of this fiscal, and it has moved both ways since 2005, it appreciated to 43.10 against USD on 21st July 2005 on the day China revalued its currency and depreciated to 3 year high at 46.56 on 20th May 2006.

To manage foreign exchange risks in present situation is a daunting task and calls for suitable selection of various currency options strategies combinations which when applied in the below mentioned varied market conditions will provide hedge against risk.

- Bullish or Bearish market conditions
- Volatility or stagnant market conditions

However, in the absence of capital account convertibility and financial infrastructure availability, coupled under-developed banking and financial system and exchange control regulations and restrictions, various currency

options strategies cannot be effectively and judiciously applied for managing risks.

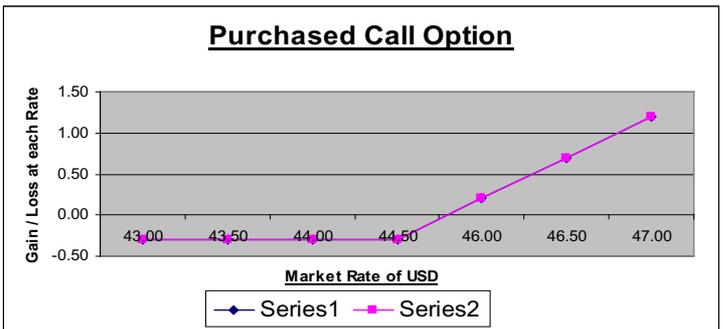
Currency options in India can only be booked or cancelled for genuine or contingent exposures. Banks in India are not allowed to offer option products with no underlying exposures and only European options are allowed. This restriction discourages applicability of various options combinations. The expiry date of option should not exceed the maturity of the underlying exposure. Corporate have to sign ISDA agreement with banks before undertaking option deals.

Currency option strategies for Import transactions in Bullish Market conditions



Purchased Call option: Corporate buys a USD call option for covering its import transactions from a ABN AMRO bank on 1st June 2006, at a strike rate of 45.50. The expiry date is 3 months i.e. 31st August 2006. The premium is 30 paise on the call. Gain or loss at various levels of exchange rate are demonstrated below vide pay off table and graph.

Market Rate	Exercise Rate	Premium	Gain/Loss
	CALL@45.50	Paid	
43.00	0.00	0.30	-0.30
43.50	0.00	0.30	-0.30
44.00	0.00	0.30	-0.30
44.50	0.00	0.30	-0.30
46.00	0.50	0.30	0.20
46.50	1.00	0.30	0.70
47.00	1.50	0.30	1.20



When spot exchange rate rises above the strike price, there are gains, when it falls below the strike price there are losses, which are maximum to the extent of premium paid.

Comparison of purchased call options with

forward contracts for evaluating the decision whether to cover imports by forward contracts or purchased call options: A fortune MNC in telecommunications purchased a call option of 2 million USD for covering imports on 1st June 2006, with a expiry date on 31st August 2006. The premium on call for a 3-month duration is 20 paise. Forward contract quote for the same expiry date was spot 43.85 with a premium of 15 paise. The total cost of forward contracts is 44.00.

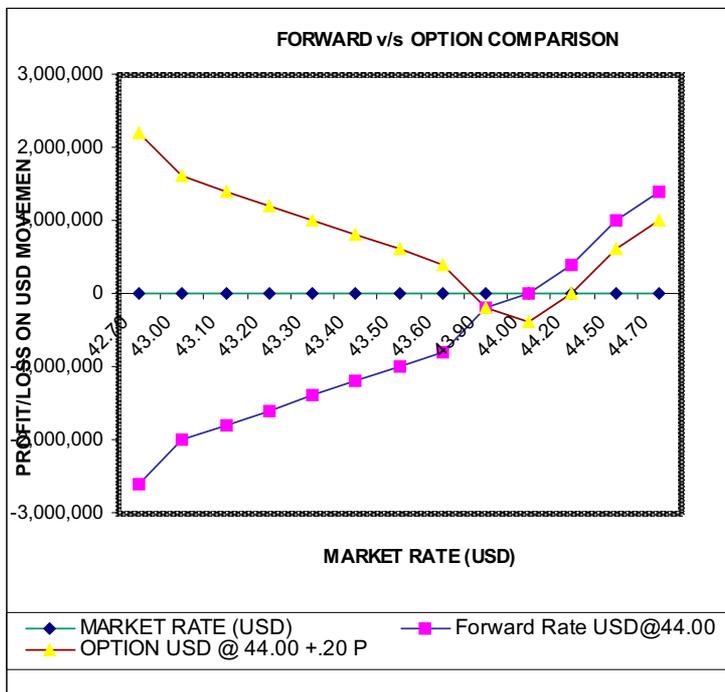
In the Pay Off Table A when USD depreciates, purchased call options are profitable than forward contracts, because options provides downside protection against risk of opportunity loss, however when USD appreciates, purchased call options are less profitable than forward contracts Since the objective of hedging is to minimize and cover loss, it is advisable to cover imports through purchased call options.

Purchasing Call option & Selling Put Option

A leading petrochemicals importer purchases USD call option from Citibank at a strike rate of 45.50, & sells USD Put option at a strike rate of 45.50. The premium paid on purchasing call option is 30 paise and received on selling Put option is 20 paise.

Gain or loss at various levels of exchange rate are shown through Pay Off Table A. This strategy is aggressive strategy, suited for situations when the Market is appreciating. The gains will be substantial. However, it is advisable to select

Table A		
OPTION v/s FORWARD COMPARISON		
		(In INR)
MARKET	FORWARD	PURCHASED CALL OPTION
RATE USD	USD is at 44.00	USD@44.00 + 0.20
43.70	44.00	44.00
2,000,000		0.20
42.70	(2,600,000)	2,200,000
43.00	(2,000,000)	1,600,000
43.10	(1,800,000)	1,400,000
43.20	(1,600,000)	1,200,000
43.30	(1,400,000)	1,000,000
43.40	(1,200,000)	800,000
43.50	(1,000,000)	600,000
43.60	(800,000)	400,000
43.90	(200,000)	(200,000)
44.00	0	(400,000)
44.20	400,000	0
44.50	1,000,000	600,000
44.70	1,400,000	1,000,000



earned extra by selling put option. Gain or loss at various levels of exchange rate are shown above vide pay off table and graph. We can also book forward contract or purchase call option with this strategy.

strike price of put option less than strike price of call option, when the market is expected to appreciate.

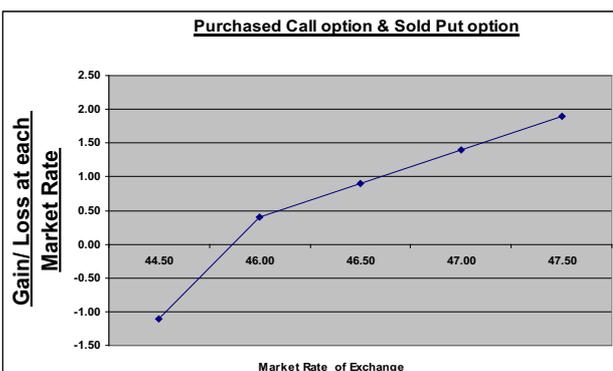
Selling Put Option: A leading garment exporter sold Put option to bank in which USD shall be purchased at 45.50, Premium earned by selling put option is 30 paise.

Currency Option strategies for Import transactions in Volatile Market conditions

Long Straddle: Purchase of Call option & Put option at the same exercise rate & expiration date.

A fortune MNC in consumer electronics purchased a Call option & Put option of USD at

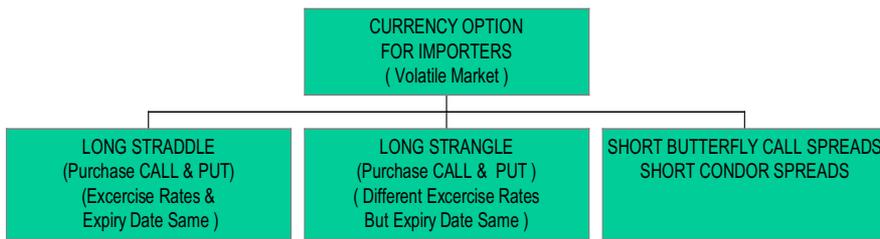
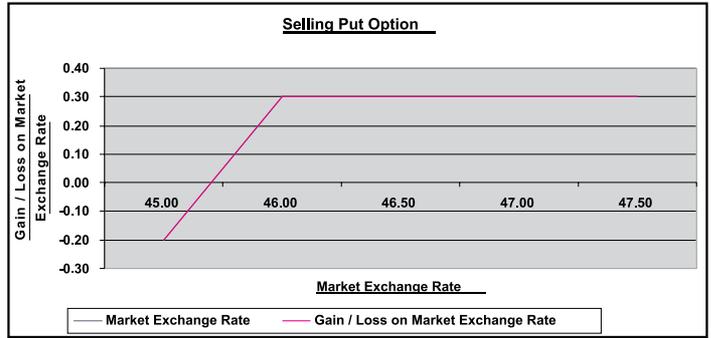
Market Rate	Exercise Rate	Premium	Exercise Rate	Premium	NET	Gain /
	<u>CALL@45.50</u>	Paid	<u>PUT@45.50</u>	Received	COST	Loss
44.50	0.00	0.30	-1.00	0.20	0.10	-1.10
46.00	0.50	0.30	0.00	0.20	0.10	0.40
46.50	1.00	0.30	0.00	0.20	0.10	0.90
47.00	1.50	0.30	0.00	0.20	0.10	1.40
47.50	2.00	0.30	0.00	0.20	0.10	1.90



It is an aggressive strategy suited for situations when there is a very strong expectation for home currency to depreciate. Premium will be

an exercise rate of 45.50, premium paid to bank is 20 paise & 30 paise for Call & Put respectively. This strategy is very profitable in situations

Market Rate	Exercise Rate	Premium	Gain /
	Selling PUT@ 45.50	Received	Loss
45.00	-0.50	0.30	-0.20
46.00	0.00	0.30	0.30
46.50	0.00	0.30	0.30
47.00	0.00	0.30	0.30
47.50	0.00	0.30	0.30



Purchased Put option: A fortune 100 office automation MNC buys a USD Put option for covering its export transactions from Citi bank on 1st June 2006, at a strike rate of 45.50. The

when market is volatile. In stagnant market there is a loss. The hedger gains when exchange rate moves in either direction. Since there are no underlying exposures to cover purchase of put option, this option product is not available with banks in India. Similarly Long Strangle and short butterfly call spreads are also not available with banks in India because of no underlying exposures to cover purchase of put options, which is a precondition.

expiry date is 3 months i.e. 31st August 2006. The premium is 30 paise on the Put.

The above pay off table and graph demonstrates that on appreciation of home currency above the strike price, there are gains, when it depreciates below the strike price; there are losses, which are maximum to the extent of premium paid.

Currency Option Strategies for Export Transactions in Bearish Market Conditions

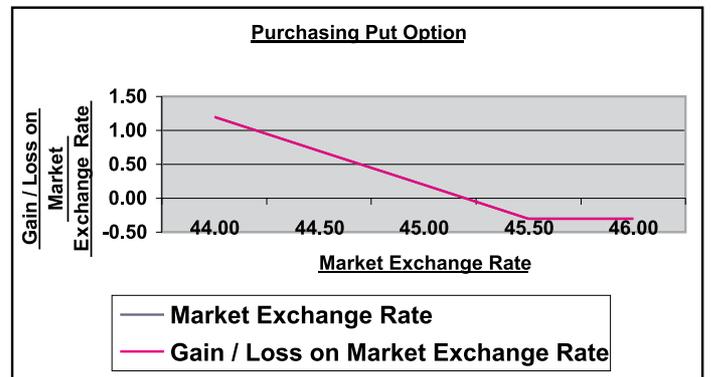
Currency Options Greeks: Hedgers calculate and use range of ratios to predict the options price behavior on any change in one of the underlying factors.

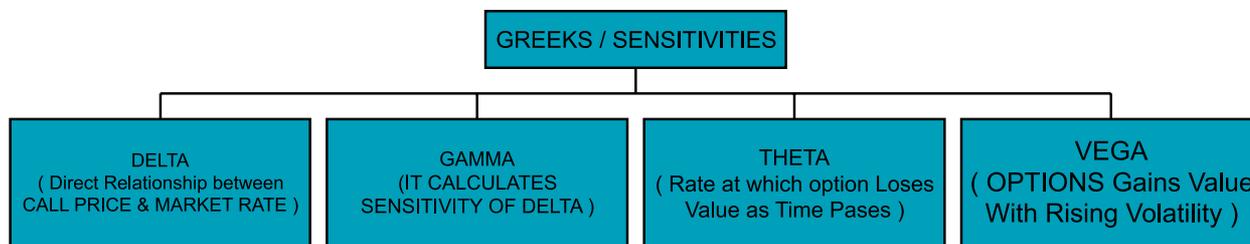


Delta – Measures the change in option premiums for a change in the spot exchange rate.

Gamma – It calculates

Market Rate	Exercise Rate	Premium	Gain /
	Long PUT@ 45.50		Loss
44.00	1.50	0.30	1.20
44.50	1.00	0.30	0.70
45.00	0.50	0.30	0.20
45.50	0.00	0.30	-0.30
46.00	0.00	0.30	-0.30





the sensitivity of delta, with respect to change in spot exchange rate.

Theta – It is a measure of option sensitivity with respect to expiration time.

Vega – It measures the sensitivity of the options premium with respect to volatility of underlying asset.

Conclusion

Currency options are powerful and flexible

forex risk management tool. They provide downside protection against risk and upside benefit from favourable movements in exchange rates. There are various option strategies and combinations which when applied in the volatile, stagnant, bullish, bearish market conditions, will provide hedge against risk. However, its applicability in India is still a long way to go due to exchange control restrictions, coupled with under-developed banking and financial system and financial infrastructure availability. □

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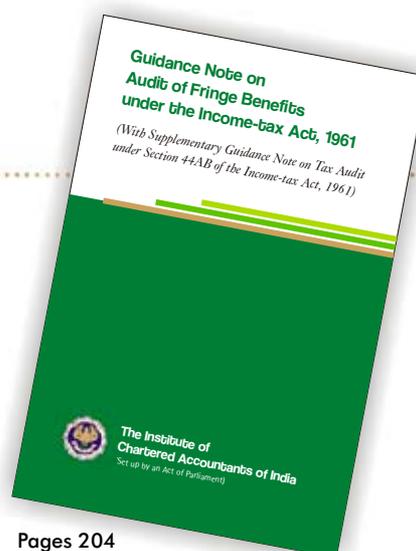
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