Currency options

Introduction

Currency options have gained acceptance as invaluable tools in managing foreign exchange risk. They are extensively used and bring a much wider range of hedging alternatives as a result of their unique nature. Options are fundamentally different from forward contracts, as whereas the parties are committed or 'locked-in' to a future transaction in a forward contract, the buyer (holder) of an option contract has the right, but not the obligation to complete the transaction at some time in the future. Options are attractive financial instruments to portfolio managers and corporate treasuries because of this flexibility.

Options contracts

Simply stated, an option contract is a choice. The holder of the option has the right but not the obligation to buy or sell a fixed amount of currency at a fixed rate of exchange at a predetermined date in the future. It is entirely up to that buyer whether or not to exercise that right (that is take up the right of the option), only the seller of the option is obligated to perform. The option holder (buyer) can therefore choose the better price – either from the prevailing market price at the time, or the price specified in the option. An option can be regarded as a form of insurance; if the market moves against you, you will be protected and can still take advantage of better prices should the market move in your favour.

Types of options contracts

Two types may be bought and sold:

Call options give the buyer the right to buy the underlying currency. The holder of a call option has the right to buy the underlying currency, while the seller of the call option has the obligation to sell the underlying currency if and when the holder thereof takes up the right.

Put options give the buyer the right to sell the underlying currency. The holder of a put option has the right to sell the underlying currency, while the seller of the put option has the obligation to buy the underlying currency if and when the holder thereof takes up the right.

In a foreign exchange transaction, one currency is bought, while another is simultaneously sold. An option to buy US dollars against the SA rand (USD Call) is an option to sell SA rand against the US dollar (Rand Put). 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.

Importers:	Buy call Sell put	} If either option is exercised, Client buys currency
Exporters:	Buy call Sell put	} If either option is exercised, Client buys currency

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, in which the US dollar is quoted in terms of units of foreign currency per US dollar.

A European style option may be exercised on the expiration date of the option only, while American style options may be exercised at any time up to and including the expiration date.

Options terminology

- **Buyer (Holder):** The owner of the option contract.
- **Premium:** When options are bought, the premium (cost of the option) has to be paid at the time of purchase that is up front.
  The actual amount of the premium depends on a number of factors, which take into account how likely it will be that the option will be exercised (takes up the right of the option). The premium is a percentage of the value of the underlying currency and represents compensation to the seller for the risk involved with the option contract over the option period.
- **Exercise:** To exercise the option means to call upon the right granted in terms of the option. The buyer (holder) will be the party exercising the option.
- **Strike price / Exercise price (Rate):** This is the price (rate) at which the buyer (holder) of the option is entitled to either buy or sell the underlying currency. The strike price is determined at the time the option is purchased.
- **Expiry / Expiration date:** The final date at which the option may be exercised in terms of the option contract that is the day on which the option expires.

Options pricing dynamics

An option contract, from a buyer's point of view is the same as buying an insurance policy. In the same way that insurance premiums are based on the probability of a claim being made, the price of an option also represents the measure of risk which will be assumed by the seller of the contract. The option value or premium, can be split into two components – Intrinsic value and Time value.

Intrinsic value

This represents the amount of money, if any, that could currently be realised by exercising an option with a given strike price. For example, a call option has intrinsic value if its strike price is below the spot exchange rate. A put option has intrinsic value if its strike price is above the spot exchange rate.

In-The-Money: This term is applied to an option that has intrinsic value. That is when a profit can be realised upon exercising it. For a call option, it is the case when the spot exchange rate is higher than the strike price of the option, and for a put option, when the spot exchange rate is below the strike price.

Out-the-Money: A call option is said to be "out-of-the-money" if the underlying spot exchange rate is currently less than the strike price of the option. A put option is said to be "out-of-the-money" if the underlying spot exchange rate is currently more than the strike price of the option. An option that is "out-of-the-money" at expiry will have no value, and the holder of the option will allow it to expire worthless.

At-The-Money: This means that the strike price and the spot exchange rate are the same. Like the "out-of-the-money" option, the holder would allow the option to expire.

Shown in table form:

Option type	Spot exchange rate is greater than strike price	Spot exchange rate is equal to strike price	Spot exchange rate is less than strike price
Calls	In-The-Money	At-The-Money	Out-Of-The-Money
Puts	Out-Of-The-Money	At-The-Money	In-The-Money

Time Value

Time value is a little more complex. When the price of a put or call option is greater than its intrinsic value, it is because the option has time value. Time value is determined by: the spot price; the volatility of the underlying currency; the exercise price; the time to expiration; and the difference in the 'risk-free' rate of interest that can be earned by the two currencies. The time value of the option contract will diminish over the life of the option and at expiration will be zero. The time value portion of an option is at its greatest when the option is "at-the-money:, that is the strike (exercise) rate is equal to the market rate. This is because the entire premium is equal to time value, as the option has no intrinsic value.

Shown in table form:

Option type	Spot exchange rate is greater than strike price	Spot exchange rate is equal to strike price
In-The-Money	>50%	Intrinsic value plus time value
At-The-Money	50%	Only time value
Out-Of-The-Money	<50%	Less time value than "at-the-money"

Key features of options

1. **Flexibility:** Once a company has determined their risk management goals, options can very often be used to achieve them. The solution will always involve a risk vs. return trade off and the company itself will determine the degree of protection required in respect of the premium involved and the benefits (or upside potential) retained. Thus, the company has the ability to set the strike rate and the maturity to suit particular and specific requirements.
2. **Combining long and short positions:** Long and short positions can be combined on put and call options to create pay-offs which specifically fit the underlying exposure.

Applications

Exporter

Vanilla options: Buy USD Put / ZAR Call

Definition	An exporter acquires the right but not the obligation to sell a fixed quantity of USD at a specified rate on a specified date.
Why use	Offers protection against adverse movements in the exchange rate and introduces flexibility.
When to use	The expectation that the spot rate may be above the forward rate at maturity. This strategy gives an Exporter protection against an appreciating exchange rate while allowing unlimited participation in a depreciating exchange rate.
Opportunity cost	The cost is limited to the premium paid while retaining unlimited potential benefit.
Premium	Premium payable, value spot.
Strike levels	This strategy is flexible and the exporter can set the strike at any level. Note: The higher the strike the higher the premium.
Optionality	An exporter has the right to enforce the contract to exchange currency for one another but will not exercise the option if it is more beneficial to deal in the spot market.

USD Put / ZAR Call

Spot: 5.9000

Fwd: 5.9700 (3 months)

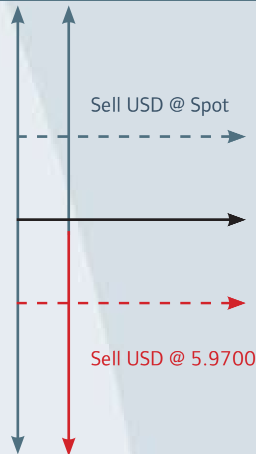
Strike: 5.9700 (ATMF)

Premium: 22.64 ZAR cents per USD

Breakeven: 6.1964

Worst Case: 5.7436

5.9700



Participation

Breakeven: 6.1964

FWD

Worst case: 5.7436

Protection

On maturity	
Spot rate higher than strike rate:	The option would expire worthless and would not be exercised. The exporter would sell USD in the spot market at the higher rate and effectively receives the spot rate minus initial premium.
Spot rate lower than strike rate:	The exporter would exercise the option and sell USD at the strike rate. The exporter effectively receives the strike rate minus initial premium.
Breakeven defined	The breakeven rate is the level of spot where the USD Put / ZAR Call outperforms forward cover. The exporter should hold the view that he would realise a rate better than the breakeven level otherwise it would have been better to have hedged via the FEC.
Types	European and American

Other types of export options

Collar: Export zero cost: Provides an exporter with a trading range, which protects against adverse appreciation of the currency, while limiting potential participation in favourable depreciation of the currency. This provides flexibility in management of Export exposures. The collar offers a zero premium hedge where the spot rate is expected to be higher than the forward rate at maturity.

Step-up Option: Step-Up Forward: Allows an exporter to achieve an effective rate better than the forward rate. Used to achieve Export rates at a premium to the forward rate. This structure suits an exporter with regular commitments and offers a fixed rate, which is higher then the current forward rate.

Export participation option: Allows for participation in favourable exchange rate movements. Provides protection and introduces flexibility. Use when your view is that the spot rate may be above the forward rate at maturity.

Geared export collar: Provides an exporter with a range which protects against an adverse appreciation of the currency while limiting potential participation in a favourable currency depreciation. Provides flexibility in management of export exposures. This structure suits an exporter with regular commitments and is applicable when the spot rate is expected to be higher than the forward rate at maturity.

Importer

Buy USD Call / ZAR Put

Definition	An importer acquires the right but not the obligation to buy a fixed quantity of USD at a specified rate on a specified date.
Why use	Offers protection against adverse movements in the exchange rate and introduces flexibility.
When to use	When the expectation is that the spot rate may be below the forward rate at maturity. This strategy gives an importer protection against an depreciating exchange rate while allowing unlimited participation in a appreciation of the exchange rate.
Opportunity cost	The cost is limited to the premium paid while retaining unlimited potential benefit.
Premium	Premium payable, value spot.
Strike levels	This strategy is flexible and the importer can set the strike at any level. Note: The lower the strike the higher the premium.
Optionality	An importer has the right to enforce the contract to exchange currency for one another but will not exercise the option if it is more beneficial to deal in the spot market.

USD Put / ZAR Call

Spot: 5.9500

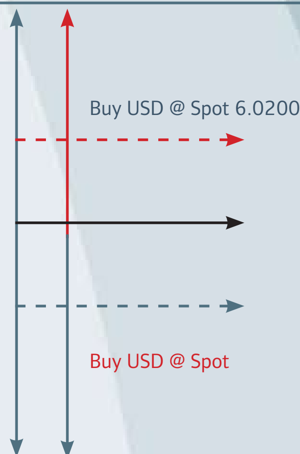
Fwd: 6.0200 (3 months)

Strike: 6.0200 (ATMF) **6.0200**

Premium: 22.87 ZAR cents per USD

Breakeven: 5.7913

Worst Case: 6.2487



Protection

Worst case: 6.2487

FWD

Breakeven: 5.7913

Participation

On maturity Spot rate lower than strike rate: Spot rate higher than strike rate:	The option would expire worthless and would not be exercised. The importer would purchase USD in the spot market at the lower rate and effectively pay the spot rate minus initial premium. The importer would exercise the option and purchase USD at the strike rate. The importer effectively pays the strike rate plus initial premium.
Breakeven defined	The breakeven rate is the level of spot where the USD Call / ZAR Put outperforms forward cover. The importer should hold the view that he would realise a rate better than the breakeven level otherwise it would have been better to have hedged via the FEC.
Types	European and American

Other types of import options

Step-Up Option: Step-Up Forward: Allows importers to achieve an effective rate better than the forward rate. Used to achieve import rates at a discount to the forward rate. This structure suits an importer with regular commitments and offers rates which are lower than the current forwards.

Import participation option: Allows for participation in favourable exchange rate movements. Provides protection and introduces flexibility. Use when you take the view that the spot rate may be below the forward rate at maturity.

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