

A Basic Guide to Options

Introduction

“Hedging is the process of substituting a certain, or known, outcome for an uncertain one”

A gold producer, for example, does not know what the spot price of gold will be a year from now, but it can hedge future gold sales by selling gold forward at the known one-year forward price. This will enable the producer to determine cash flows in advance - at least that part of it which depends on the fluctuating price of spot gold - and simplify financial planning. The actual spot price of gold a year from now may be higher than the pre-agreed forward rate, or it may be lower. Thus, by hedging and substituting a known price for an unknown one, the gold producer could either suffer an opportunity loss as an opportunity gain.

However many participants that need to manage future cash flows in the gold market are actually not looking for a fixed forward price, but rather for a price boundary guarantee. A future seller of gold might want a guarantee that the sales price will not fall beyond a minimum level below which the company could not tolerably live with, but otherwise would prefer to remain un-hedged in hopes the market price will rise. Similarly, a future gold buyer might look for a guarantee that the purchase price will not rise above an acceptable maximum level, but likewise would prefer to remain un-hedged in hopes the market price will fall.

The gold market creates and sells such guarantee or insurance contracts. In the financial literature these products are called options contracts. Naturally the market does not provide such insurance contracts for free, like anything else, they are available for a price. The price or amount paid for an option (or price guarantee or price insurance) is called the premium. Options can be traded “Over-The-Counter” and at organized securities and futures exchanges.

OTC Gold Options are typically provided by bullion banks, or commodity market makers, to clients on a bilateral basis and offer total flexibility with respect to Strike prices, Expiry dates and Size of trades and so can be tailor made to suit clients’ specific hedging requirements. It is possible to trade OTC options for periods as short as one day and as far forward as 10 years and OTC options are typically European Style - this means that they can only be exercised on the maturity date – and are usually cheaper than American Style options. Buyers of OTC options do not pay margin, however sellers may be required to post original and variation (or maintenance) margin in the event that prices move against the option sold.

ETO’s - Exchange Traded Gold Options are executed on a Futures Exchange such as the COMEX with the Exchange as the central counterparty for all transactions. These options are for fixed strikes, amounts and future expiry dates and if exercised become an underlying futures contract. The maturity of a COMEX gold option is on the 2nd Friday of the month prior to the underlying COMEX futures month. For example, options on the April 2015 gold contract will expire on Friday 13th March. Buyers of an exchange-traded option do not pay margin, simply the up front premium, whereas Sellers have to margin their positions. COMEX options are American Style - this means that they can be exercised into the underlying futures contract at any time prior to expiration.

Options are regarded by some circles as speculative instruments that help to cause unnecessary and unwanted price volatility. However the truth is that an option is actually a form of price insurance, which is an important tool in managing price risk and market exposure.

What is an Option?

The buyer of an option has the right but not the obligation to buy (in the case of a Call Option) or sell (in the case of a Put Option) the underlying asset at a pre-agreed price (The Strike) on, in the case of “European Style Options”, the maturity of the contract (Expiry Date). With a Call Option, the seller of the option has the obligation to deliver the asset at the pre-agreed strike price at (European) or before (American) the expiry date if the buyer “Calls” the option. In the case of a Put Option, the seller has the obligation to buy the asset at the pre-agreed strike on or before the expiry date if the buyer “Puts” the option. The buyer of the option is sometimes referred to as “The Holder” or “The Owner” of the option with risk limited to the option premium paid. The seller of the option is also known as “The Writer” or “The Grantor” and is subject to unlimited risk until the option expires.

What is the Option Price?

The option price, or premium, is the amount the buyer of the option has to pay to the seller for the right to own the option. The seller needs to be rewarded in exchange for the risk being taken. It is typical market practice for the premium to be settled within two working days after the deal date. The option price equals the intrinsic value plus time value.

What is Intrinsic Value?

Intrinsic value is the amount by which the option is “in the money”, it is the difference between the strike price and the forward price and must always be greater than or equal to zero. The intrinsic value for a Call Option is the forward price minus the strike price, whereas intrinsic value for a Put Option is the strike price minus the forward price.

What is Time Value?

Time Value is the additional value given to an option prior to expiry to compensate the seller of the option for the chance that the option may be exercised, i.e. that it will be “In The Money” at expiry. Time Value increases as the tenor of the option is lengthened and is at its greatest when the option is “At The Money”. As Time Value approaches zero (expiry date) the options goes very deep in the money or out of the money.

What does “At The Money”, “In The Money”, and “Out of The Money” mean?

- “At The Money” (ATM) is a term that describes an option with a strike price that is equal to the current market price of the underlying asset.
- “In The Money” (ITM) is a term used to describe an option with intrinsic value. For standard options, a call option is “in the money” if the current price of the asset is above the strike price. A put option is “in the money” if the current price of the asset is below the strike price.
- “Out of The Money” (OTM) is a term used to describe an option that has no intrinsic value. The option’s premium consists entirely of time value. For standard contracts, a call option is “out of the money” if the asset price is below the strike price. A put option is “out of the money” if the asset price is above the strike price.

What are the main elements in pricing an Option?

There are five main elements used by options market makers when calculating the price of an option, these are:

Underlying Price | Strike Price | Expiration Date | Contango Rates | Interest Rates | Volatility

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The Underlying Price

- When pricing an option, the current underlying price will determine the degree by which the option is in or out-of-the-money, and thereby one element of the option price.
- The more out-of-the-money an option is, the lower the option's premium.
- The level of the underlying price at expiration determines the final profitability of the trade

The Strike Price

- The strike price is the agreed upon price at which the option buyer has the right to buy (in the case of a call) or sell (in the case of a put) the underlying asset.
- The lower the put strike or higher the call strike the lower the option premium. A higher put strike or lower a call strike results in a higher option premium.

Expiration Date

- The option expiration date is the agreed upon date at which the option buyers rights are cancelled.
- The later the expiration, the more expensive the option premium

Contango Rates

- When Gold is in "Contango" the price for a future delivery is greater than the current spot price.
- A "Backwardation" market is the opposite, i.e. price for a future delivery is lower than the spot price.
- Whether the gold market is in Contango or Backwardation is a function of the respective interest rates for US dollars and Gold for the future period. If US dollar interest rates are higher than gold interest rates, the market is in Contango – This is typical in gold. If gold interest rates are higher than US dollar interest rates, the market is in backwardation; historically unusual but it was often the case in 2014.
- In precious metals contango rates are an important element in the calculation of an option premium.

Interest Rates

- The current interest rate for US dollars is used to determine the cost of financing the option premium for the duration of the option's life, higher interest rates on money result in lower option premiums.

Volatility

- Volatility is a measure of the variability of price movements in the underlying asset. The higher the variation in price the more likely that the option will expire 'in the money'.
- Volatility is usually calculated as the annualized standard deviation of daily percentage price changes over a period of time, e.g. monthly, quarterly etc.

Historic Volatility

- This is the actual or realized price volatility of the underlying asset.

Implied Volatility is the measure of anticipated market activity through the life of the option

- This is the unknown and the key pricing parameter hence can be implied in options pricing models. Options market makers will take views on the market through their bias of implied volatility – A market maker will "bid up" implied volatility if an increase in erratic price movement, up or down, is expected; whereas if it anticipates the market entering a period of quiet, sideways trading the market marker will "offer" the "VOL".
- Implied volatility varies depending on the tenor and strike price of the option.
- Higher volatility results in a higher option premium,
- "Out of the money" options carry a higher implied VOL.

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The Option “Greeks”

These are key terms used in the options market that need to be explained in order to fully understand options.

Delta

- The option delta reflects the spot or forward equivalent position resulting from an option position.
- Buying calls results in a delta long position; buying puts results in a delta short position.
- The Delta is the rate of change in the option price with respect to the change in the underlying asset price. For example if the option price changes by \$.50 for a \$1.00 change in the underlying asset price, the Delta equals 50%. This is referred to as “At The Money”
- As an option goes deeper “ITM”, the Delta approaches 100%, and as an option goes further “OTM”, the Delta approaches 0%.
- As time to expiry reduces, the Delta will approach 100% for an ITM option and 0% for an OTM option.
- An increase in volatility increases the Delta for OTM options and decreases the Delta for ITM options.

Gamma

- Gamma is the rate at which the delta changes with a move in the underlying price.
- Gamma is always highest for “ATM” options and decreases as an option goes “ITM” or “OTM”.
- For “ATM” options, Gamma increases as time to expiry decreases.
- An increase in Volatility will decrease the Gamma for “ATM” options and increase the Gamma for “ITM or “OTM” options.

Vega

- Vega is the change in the option price for a given change in volatility, usually 1%.
- Vega is highest for “ATM” options and decreases as options move either “ITM” or “OTM”.
- Vega increases as the time to expiry increases.
- Changes in Volatility only affect the Vega of “ITM” and “OTM” options.
- As Volatility increases, the Vega rises and vice-versa.

Theta

- Theta is the measure of daily time erosion or “rate of time decay”.
- Theta is highest for “ATM” options as they have the highest Time Value.
- Theta increase as time to expiry decreases.
- Theta increases as volatility increases.

Rho

- Rho is the measure of interest rate risk associated with an option position.
- It relates to the effect money interest have on the option premium.

Option Strategies

There are many varied options strategies that investors can use to both mitigate risk and add value

Long Call

The long call option strategy is the most basic option trading strategy whereby the investor buys a call option with the belief that the price of the underlying asset will rise significantly beyond the strike price before the option expiration date. Compared to buying the underlying asset outright, the call option buyer is able to gain leverage since the lower priced calls appreciate in value faster percentagewise for every point rise in the price of the underlying asset. However, call options have a limited lifespan and if the underlying asset price does not move above the strike price before the option expiration date, the call option will expire worthless. Since there is no limit as to how high the asset price can be at expiration date, there is no limit to the maximum profit possible when implementing the long call option strategy. Risk for the long call options strategy is limited to the price paid for the call option no matter how low the asset price is trading on expiration date.

Long Put

This is an options strategy in which a put option is purchased as a speculative play on a downturn in the price of the underlying asset. In a long put trade, a put option is purchased in anticipation that the underlying asset will fall in price, thereby increasing the value of the options. The options can either be sold prior to expiration (for a profit or loss) or held to expiration, at which time the investor must purchase the asset at market prices and sell the asset at the pre-agreed Strike price. The long put strategy is an alternative to an investor simply selling an asset short, and then buying it back at a profit if the asset falls in price. Options can be favored over shorting due to increased leverage and a capped maximum loss (the investor cannot lose more than premium paid).

Covered Calls

Aside from the long call option strategy, an investor can also engage in a basic covered or buy-write strategy. This involves purchasing an asset outright (or already owning the asset) and simultaneously writing (or selling) a call option on the same asset. The volume of assets owned should be at least equivalent to the size of the call options sold. Investors often use this strategy when they hold assets, have a neutral to negative opinion on the likely price direction of the assets and are looking to generate additional profits through receipt of the call premium or protect against a potential decline in the underlying asset's value. An investor holding gold, which is a zero to low interest-bearing asset and usually held as strategic store of value, can choose to sell or "write" a "Covered Call" option in order to lower the effective cost of holding such an asset. The risk for the investor is that the gold might be 'called away', however this would be at a much higher price than the current market value and would typically be for a modest percentage of the investor's total gold holdings. Covered call strategies can be particularly useful for generating profits in flat or sideways trading markets and, in some scenarios, they can provide higher returns with lower risk than their underlying investments. Such strategies pair a long position with a short call option on the same asset. The combination of the two positions can often result in higher returns and lower volatility than the underlying asset itself. For example, in a flat or falling market the receipt of the covered call premium can reduce the effect of a negative return or even make it positive. And when the market is rising, although the returns of the covered call strategy will typically lag behind those of the underlying asset, they will still be positive. However, covered call strategies are not always as safe as they appear. Not only is the investor still exposed to market risk, but also the risk that over long periods the accumulated premiums may not be sufficient to cover the losses. This situation can occur when volatility remains low for a long period of time and then climbs suddenly.

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Protective Puts

This is a risk-management strategy that investors can use to guard against the loss of unrealized gains. The put option acts like an insurance policy - it costs money, which reduces the investor's potential gains from owning the asset, but it also reduces the risk of losing money if the asset declines in value. If an investor purchased Gold for \$1,800 that is now worth \$1,900 but has not sold it, the investor has unrealized gains of \$100 per ounce. If the investor does not want to sell yet because of a belief that Gold will appreciate further but wants to make sure that the \$100, or most of it at least, in unrealized gains is not lost, the investor can purchase a put option for that will protect the investor for as long as the option contract is in force. In the case of Client, the company holds much of its assets in gold in various forms but especially in physical, and the increase in price to a record level of \$2,072 in 2020 and the highest ever annual closing price of \$1900, that represented a year on year gain of 25%, had a significantly beneficial impact on Client’s financial performance for the fiscal year ending December 31st 2020. The senior management of Client are keen to protect the value of its core gold holdings and this strategy is recommended; although it may appear to be expensive, the company will benefit in full from any further year on year increase in the gold price in 2021 while at the same time ensuring that that losses are limited to strike price of the put option purchased and the premium cost of purchasing the price insurance. Here is an historic example:

Spot gold basis \$1900 | Gold Option expiry date is 28/12/21 | Premium indications as at 28/05/21

Put		Call	
Premium	Strike	Strike	Premium
\$90.00	1900	1950	\$74.00
\$77.00	1875	1975	\$66.00
\$65.50	1850	2000	\$58.50
\$55.50	1825	2025	\$52.00

Using the above pricing matrix, if the client buys a Put option with a strike price of \$1900 and expiry date of 28th December 2021, the cost will be \$90 per ounce. It means that the worst case scenario for the financial year end 2021 would be no revaluation loss, no matter how low the gold price is at the year end and the only cost is the \$90 per ounce paid for the options insurance. On the flip side the client would benefit from any rally in the gold price in 2021 with any upside difference between the strike price of \$1900 and the price at the end of 2021 effectively reducing the premium cost of the put insurance until reaching a break even price of \$1900. Anything above this price would go straight to the client’s bottom line as a plus for the 2021 accounts. However if the client wishes to mitigate the upfront cash flow impact of buying expensive ‘at the money’ options price insurance this can be done by using a lower strike price that is ‘out of the money’. For example buying a Put option for the same expiry date as above but with a strike price of \$1825, the premium cost will be \$55 per ounce. If the gold price at the end of 2021 is below the price at the end of 2020, i.e. \$1900, there will be an additional revaluation loss that is capped at \$75 per ounce. In this example the worst case scenario is a total cost of \$130 per ounce, i.e. \$55 + \$75. There are many permutations that can be considered but the key point is that the value of strategically important company assets should be insured with the excess on an insurance policy being similar to how far out of the money the option strike is.

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Married Puts

In a married put strategy, an investor who purchases, or already owns, a particular asset such as gold simultaneously purchases a put option for an equivalent number of ounces. Investors will use this strategy when they are bullish but wish to protect themselves against potential short-term losses. This strategy essentially functions like an insurance policy, and establishes a floor should the asset's price plunge dramatically. Married puts are one of the few ways that an investor can protect the downside of an investment. This protection comes at a cost, and it is important to use this strategy only in certain situations. If the investor thinks that gold will go up but is wary of a possible disaster, then the married-put strategy can be very useful. Married puts can provide a great means of limiting your losses but as in any options trade the investor must always make sure to consider the worst-case scenario.

Protective Collars

A protective collar consists of a put option purchased to hedge the downside risk of an asset, plus a call option written on the asset to finance the put purchase. Another way to think of a protective collar is as a combination of a covered call plus long put position. The put and call are typically "out of the money" (OTM) options, but have the same expiration and ideally are for the same volume. The combination of the long put and short call forms a "collar" for the underlying asset that is defined by the strike prices of the put and call options. The "protective" aspect of this strategy arises from the fact that the put position provides downside protection for the asset until the put expires. A protective collar is usually implemented when the investor requires downside protection for the short to medium term, but at a lower or even zero cost. Since buying protective puts can be an expensive proposition, writing OTM calls can defray the cost of the puts quite substantially. In fact, it is possible to construct protective collars that are either "costless" – these are also called "zero cost collars" – or actually generate a net credit for the investor.

This kind of strategy was popular with gold producers, and their bullion bankers, who needed to ensure that the value of the gold assets in the ground was protected against downside moves in the gold price. However the main drawback of this approach is that the producer gives away upside in the gold price in exchange for obtaining downside protection. The protective collar strategy works well in bear markets, as it did between 1980 and 2001 when gold declined steadily from \$850 to \$250 but not so well if the gold surges ahead and is "called away," as any additional gain above the call strike price will be lost. This was the case in from the summer of 2001 until 2011 when gold posted a series of all time highs that culminated with record price of \$1920 in September and hedging became highly unpopular with investors in gold mining companies and was been repeated in 2020 when gold surged from \$1450 to a fresh record high of \$2072.

Once again referring to the options price matrix above the client could buy Put option price insurance with a strike of \$1900 and an expiry date of 28th December 2021 at a premium of \$90 per ounce but mitigate the cost of this insurance by selling a Call option for the same expiry date with a strike price of \$2025 to earn \$52 per ounce, meaning a net cost to Client of \$48 per ounce. If the gold price is below \$1900 at the end of 2021 the client would execute the Put insurance at \$1900 meaning that there will be no revaluation loss on the year and so the impact on the client's balance sheet for 2021 is limited to the \$48 per ounce price insurance premium. If the price is between \$1900 and \$2025 at the end of 2021, the client will have the benefit of any difference between \$1900 and \$2025, which will mitigate the net cost of the insurance to \$48 per ounce with any price between \$1948 and \$2025 being an additional profit. However to execute this structure the client must be prepared to sell its gold assets at \$2025

Bull Call Spread

In a bull call spread strategy, an investor will simultaneously buy call options at a specific strike price and sell the same number of calls at a higher strike price. Both call options will have the same expiration month and underlying asset. This type of vertical spread strategy is popular with hedge funds and other speculators, often used when the investors are bullish and expect a moderate rise in the price of the underlying asset.

Bear Put Spread

The bear put spread strategy is another form of vertical spread. In this strategy, the investor will simultaneously purchase put options at a specific strike price and sell the same number of puts at a lower strike price. Both options would be for the same underlying asset and have the same expiration date. This method is used when the trader is bearish and expects the underlying asset's price to decline. It offers both limited gains and limited losses.

Long Straddle

A long straddle options strategy is when an investor purchases both a call and put option with the same strike price, underlying asset and expiration date simultaneously. An investor will often use this strategy when he or she believes the price of the underlying asset will move significantly but is unsure of which direction the move will take. This strategy allows the investor to maintain unlimited gains, while the loss is limited to the cost of both options contracts.

Long Strangle

In a long strangle options strategy, the investor purchases a call and put option with the same maturity and underlying asset, but with different strike prices. The put strike price will typically be below the strike price of the call option, and both options will be out of the money. An investor who uses this strategy believes the underlying asset's price will experience a large movement, but is unsure of which direction the move will take. Losses are limited to the costs of both options; strangles will typically be less expensive than straddles because the options are purchased out of the money.

Butterfly Spread

All the strategies up to this point have required a combination of two different positions or contracts. In a butterfly spread options strategy, an investor will combine both a bull-spread strategy and a bear spread strategy, and use three different strike prices. For example, one type of butterfly spread involves purchasing one call (put) option at the lowest (highest) strike price, while selling two call (put) options at a higher (lower) strike price, and then one last call (put) option at an even higher (lower) strike price. This type of options strategy is only appropriate for experienced, sophisticated investors.

Summary

The strategies set out above are the most popular but with OTC options there is complete flexibility in terms of the strike price, tenor or maturity of the contract and method of setting the reference price to be used for settlement and whether or not the holder of the option chooses to exercise the right to buy in the case of a call option or sell in the case of a put option. Options are price insurance with the buyer paying to insure the value of its' asset while the seller is similar to a Lloyds underwriter that receives a premium for the insurance cover being provided with the greater the risk the more expensive is the premium.