Options - Booking

This document is about the state-of-the-art booking of options - calls and puts. A short reminder of the definition of simple calls and puts (plain vanilla options) will first be given. We will deal with these options, since the complexity of the construction of the options, particularly the conditions of its exercise, do not play any role on its booking principles.

A call option gives the right (but not the obligation) to buy a given security (called underlying) to a fixed price (strike) for a given period. The call expires without value on its fixed due date. A put option gives the right (but not the obligation) to sell a given security (called underlying) to a fixed price (strike) for a given period. The put expires without value on its fixed due date. The underlying is therefore the security which can be bought or sold. It is a security in the broad sense of the word since it can also be an index, a currency, a commodity, etc. When the right to buy or to sell the underlying is used by the owner, we say that the options are exercised. For the same reason the strike price is sometimes called the exercise price.

The calls and puts are derivative products and are mainly dealt on the stock exchange, with standardized maturity dates and strike prices. These options can be bought or sold at all times, in some case even as short sales.

Booking as a separate position

A simplification of the booking of options has been commonly used for a long time and is sometimes still used today: the booking on the underlying. With this method the options are not defined as a separate position from the underlying in the accounting, all transactions are booked on the underlying, simply resulting in a change of its book value without gain or loss. For example, the purchase of options results in a book value increase of the underlying and a sale of options in a corresponding book value reduction.

This booking of the options on the underlying **does not meet modern accounting standards** and should be banned. We will later see in this document how such a booking of options results in a total lack of transparency.

For a modern and transparent booking, every option should be defined as a separate position and each of its transactions should be booked as such. The advantages of this will be shown further in this document.

Structure of the document

As already seen, calls and puts can be purchased or sold, in some case even as short sales. This document is divided in four parts, depending on whether the options are calls or puts, and whether they are bought ("long") or sold ("short").

Please note that we will not consider in this document the combined booking of options strategies, bringing together several calls and puts on the same underlying, with different strikes and maturity dates. Since each call and put is booked completely and separately, the result of the options' strategy can be analyzed with the aggregation of the results of the single options.

1. Booking of purchased calls

After having purchased calls we have a positive or "long" position of these calls. The outcome can be booked with the three following transactions (without considering supplementary purchases or combinations of these transactions).

Sale

The calls are sold, the booking is done according to the normal standard, with a booking of the realized gain or loss on calls, clearly visible on the corresponding account.

Expiration without value

The calls reach their maturity without any value, the market price of the underlying asset being smaller than the strike price. The purchase value of the calls is lost, and should be booked as a realized loss on calls.

Exercise

The calls are exercised in order to buy the underlying assets at the strike price of the calls (lower than the market price otherwise the calls would not be exercised). We therefore have to book the purchase of the underlying and the exercise, which will lead to the "disappearance" of the calls. The possibility to buy the underlying to a lower price than the market price is due to the possession and the exercise of the calls. The difference between the market value and the purchase value at strike of these underlying should be attributed to the calls. The net result of the calls (realized gain or loss) is therefore the difference between this value and the purchase value of the calls.

This accounting method allows to have a direct view on the gains or losses on the calls in the accounting. Moreover the calculations of the gain or loss of previous transactions on the underlying will really be booked on transactions of the underlying and will not be skewed by the gains or losses resulting for the exercise of the previous calls.

The only supplementary element required by this accounting method, compared with the easy method, is the knowledge of the market price of the underlying at the moment of the exercise of the calls, the closing price of that day will do just fine.

Example

On the 15.11.2004, 15'000 "Call Microsoft 22.01.2005 USD 24.50" options are purchased at the price of USD 2.20. These calls are exercised on the 20.01.2005 in order to buy the underlying "Microsoft" stocks at the strike price of USD 24.50, when the market price of the stock is actually of USD 25.86. In order to keep this example as simple as possible, the different fees will be ignored and the accounting will be presented in USD.

Purchase of the calls on the 15.11.2004

The asset account of the options is debited of USD 15'000 x 2.20 = 33'000 and the bank account is credited of the same amount.

OPTIONS	
33'000	

BANK	
	33'000

Exercise of the calls on the 20.01.2005

The asset account of the stocks is debited of USD 15'000 x 25.86 = 387'900, which correspond to the **market value** of the purchased stocks. The bank account is credited of USD 15'000 x 24.50 = 367'500, which is the actually paid amount for the stocks. The asset account of the options is credited of USD 33'000, which is the book value of the exercised calls, which therefore "disappear". The amount of USD 387'900 - 367'500 - 33'000 = - 12'600 is the realized loss on the calls. All this gives us the following booking set:

STOCKS	
387'900	

BANK	
	367'500

OPTIONS	
	33'000

LOSSES ON OPTIONS	
12'600	

Note that despite their exercise, the transaction on calls (purchase and exercise) resulted in loss. The exercise of calls allowed to buy the "Microsoft" stocks to a value of USD 387'900 - 367'500 = 20'400 inferior to the market value. However, the calls have been bought for an amount of USD 33'000, resulting in a loss of USD 20'400 - 33'000 = - 12'600.

2. Booking of calls sold short

After a short sale of calls we have a negative or "short" position of these calls. The outcome can be booked with the three following transactions (without considering supplementary short sales or combinations of these transactions).

Buyback

The calls are bought back and the booking is done according to the normal standard, with a booking of the realized gain or loss on calls, clearly visible on the corresponding account. Note that since this is a short position, a buyback price lower than the sale price will result in a gain and a buyback price higher than the sale price in a loss.

Expiration without value

The calls reach their maturity without any value, the market price of the underlying asset being lower than the strike price. The amount received from the short sale of the calls is the final result of the booking on calls and should be booked as a realized gain on calls.

Exercise

The sold calls are exercised by the buyer in order to buy the underlying assets at the strike price of the calls (lower than the market price otherwise the calls would not be exercised) that we have to sell him to this price. We therefore have to book the sale of the underlying and the exercise, which will lead to the "disappearance" of the calls. To have to sell the underlying to a lower price than the market price is due to the short sale and the exercise of calls by the buyer. The difference between the market value and the value at strike price of these underlying should be attributed to the calls. The net result of the calls (realized gain or loss) is therefore the difference between this value and the sale value of the calls.

This accounting method allows to have a direct view on the gains or losses on the calls in the accounting. Moreover the calculations of the gain or loss of previous transactions on

the underlying will really be booked on transactions of the underlying and will not be skewed by the gains or losses resulting for the exercise of the previous calls.

The only supplementary element required by this accounting method, compared with the easy method, is the knowledge of the market price of the underlying on the moment of the exercise of the calls, the closing price on that day will do just fine.

Example

On the 27.10.2004, 10'000 "Call Royal Dutch 21.03.2005 EUR 44" options are sold short at a price of EUR 1.00. These calls are exercised by the buyer on the 21.03.2005 in order to buy the underlying assets "Royal Dutch" at a strike price of EUR 44.00, when the market price of the stock is actually of EUR 45.81. We have to sell our buyer these stocks to a price of EUR 44. We suppose that we own 10'000 "Royal Dutch" stocks with a book price of EUR 42.35. In order to keep this example as simple as possible, the different fees will be ignored and the accounting will be presented in EUR.

Short sale of the calls on the le 27.10.2004

The asset account of the options is credited of EUR 10'000 x 1.00 = 10'000 and the bank account is debited of the same amount.

OPTIONS	
	10'000

BANK	
10'000	

Exercise of the calls by the buyer on the 21.03.2005

The asset account of the stocks is credited of EUR 10'000 x 42.35 = 423'500, which correspond to the book value of the sold stocks. The sale of the stocks results in a realized gain of EUR 458'100 - 423'500 = 34'600, calculated with the **market value** of the stocks. The bank account is debited of EUR 10'000 x 44.00 = 440'000, which is the actually paid amount for the sale of the stocks. The asset account of the options is debited of EUR 10'000, the book value of the exercised calls, which therefore "disappear". The realized loss on the options is of EUR 440'000 - 458'100 + 10'000 = -8'100. Note that the loss is independent from the book price of the underlying at the moment of the exercise. All this gives us the following booking set:

STOCKS	
	423'500

GAINS ON STOCKS	
	34'600

BANK	
440'000	

OPTIONS	
10'000	

LOSS ON OPTIONS	
8'100	

3. Booking of purchased puts

After having purchased puts we have a positive or "long" position of these puts. The outcome can be booked with the three following transactions (without considering supplementary purchases or combinations of these transactions).

Sale

The puts are sold, the booking is done according to the normal standard, with a booking of the realized gain or loss on puts, clearly visible on the corresponding account.

Expiration without value

The puts reach their maturity without any value, the market price of the underlying asset being higher than the strike price. The purchase value of the puts is lost, and should be booked as a realized loss on puts.

Exercise

The puts are exercised in order to sell the underlying assets at the strike price of the puts (higher than the market price otherwise the puts would not be exercised). We therefore have to book the sale of the underlying and the exercise, which will lead to the "disappearance" of the puts. The possibility to sell underlying at a higher price than the market price is due to the possession and the exercise of the puts. The difference between the market value of the underlying and the value at strike price of these underlying should be attributed to the puts. The net result of the puts (realized gain or loss) is therefore the difference between this value and the purchase value of the puts.

This accounting method allows to have a direct view on the gains or losses on the puts in the accounting. Moreover the calculations of the gain or loss of previous transactions on the underlying will really be booked on transactions of the underlying and will not be skewed by the gains or losses resulting for the exercise of the previous puts.

The only supplementary element required by this accounting method, compared with the easy method, is the knowledge of the market price of the underlying on the moment of the exercise of the puts, the closing price on that day will do just fine.

Example

On the 11.10.2005, 3'000 "Put General Electric 21.01.2006 USD 35" options are purchased to the price of USD 1.65. These puts are exercised on the 31.12.2005 in order to sell the underlying stocks "General Electric" with the strike price of USD 35, when the market price of the stock is actually of USD 33.40. We have to sell the buyer these stocks to the price of USD 35. Let's suppose that we own 3'000 of these "General Electric" stocks with a book price of USD 34.00. In order to keep this example as simple as possible, the different fees will be ignored and the accounting will be presented in USD.

Purchase of puts on the 11.10.2005

The asset account of the options is debited of USD 3'000 x 1.65 = 4'950 and the bank account is credited of the same amount.

OPTIONS	
4'950	

BANK	
	4'950

Exercise of the puts on the 31.12.2005

The asset account of the stocks is credited of USD 3'000 x 34 = 102'000, which correspond to the book value of the sold stocks. The sale of the stocks results in a

realized loss of USD 100'200 - 102'000 = - 1'800, calculated with the **market value** of the stocks. The bank account is debited of USD 3'000 x 35.00 = 105'000, which is the actually received amount for the sale of the stocks. The asset account of the options is credited of USD 4'950, the book value of the exercised puts, which therefore "disappear". The realized loss on the options is of USD 105'000 - 100'200 - 4'950 = - 150. Note that the loss is independent from the book price of the underlying at the moment of the exercise. All this gives us the following booking set:

STOCKS	
	102'000

LOSSES ON STOCKS	
1'800	

BANK	
105'000	

OPTIONS	
	4'950

LOSSES ON OPTIONS	
150	

Note that despite their exercise, the transaction on puts (purchase and exercise) resulted in loss. The exercise of puts allowed to sell the "General Electric" stocks to a value of USD 105'000 - 100'200 = 4'800 higher to the market value. However, the puts have been bought for an amount of USD 4'950, resulting in a loss of USD 4'800 - 4'950 = - 150.

4. Booking of puts sold uncovered

After a short sale of puts we have a negative or "short" position of these puts. The outcome can be booked with the three following transactions (without considering supplementary short sales or combinations of these transactions).

Buyback

The puts are bought back and the booking is done according to the normal standard, with a booking of the realized gain or loss on puts, clearly visible on the corresponding account. Note that since it is about a short position a buyback price lower than the sale price will result in a gain and a buyback price higher than the sale price in a loss.

Expiration without value

The puts reach their maturity without any value, the market price of the underlying asset being higher than the strike price. The amount received from the short sale of the puts is the final result of the booking on puts and should be booked as a realized gain on puts.

Exercise

The sold puts are exercised by the buyer in order to sell the underlying assets at the strike price of the puts (higher than the market price otherwise the puts would not be exercised) that we have to buy from him at this price. We therefore have to book the purchase of the underlying and the exercise, which will lead to the "disappearance" of the puts. To have to buy the underlying at a higher price than the market price is due to the short sale and the exercise of the puts by the buyer. The difference between the market value and the vale at strike price of these underlying should be attributed to the puts. The net result of the puts (realized gain or loss) is therefore the difference between this value and the sale value of the puts.

This accounting method allows to have a direct view on the gains or losses on the puts in the accounting. Moreover the calculations of the gain or loss of previous transactions on the underlying will really be booked on transactions of the underlying and will not be skewed by the gains or losses resulting for the exercise of the previous puts.

The only supplementary element required by this accounting method, compared with the easy method, is the knowledge of the market price of the underlying on the moment of the exercise of the puts, the closing price on that day will do just fine.

Example

On the 14.04.2005, 2'500 "Put IBM 16.07.2005 USD 80" options are sold short at a price of USD 1.00. These puts are exercised by the buyer on the 30.06.2005 in order to sell the underlying "IBM" stocks to the strike price of USD 80, when the market price of the stock is of USD 74.20. We therefore have to buy these stocks to the price of USD 80. To keep this example as simple as possible, the different fees will be ignored and the accounting will be presented in USD.

Short sale of the puts on the 14.04.2005

The asset account of the options is credited of USD 2'500 x 1.00 = 2'500 and the bank account is debited of the same amount.

OPTIONS	
	2'500

BANK	
2'500	

Exercise of the puts by the buyer on the 30.06.2005

The asset account of the stocks is debited of USD 2'500 x 74.20 = 185'500, which is the **market value** of the purchased stocks. The bank account is debited of USD 2'500 x 80 = 200'000, which is the amount really paid for the purchase of the stocks. The asset account of the options is debited of USD 2'500, which is the book value of the exercised puts, which will lead to the "disappearance" of the puts. The realized loss on the options is of USD 185'500 - 200'000 + 2'500 = - 12'000. All this gives us the following booking set:

STOCKS	
185'500	

BANK	
	200'000

OPTIONS	
2'500	

LOSSES ON OPTIONS	
12'000	

Mistakes to avoid

Booking the options on the underlying

As previously seen, this way of booking options leads to a total lack of transparency:

- No inventory involving the options can be done.
- The result of the options is not visible, since no realized gain or loss on options has been booked.

- The exercise of the options result in a distortion of the results of the underlying since a bad result on options will increase the book value of the underlying and consequently reduce the future gains on the underlying.

Not booking the exercise of options with the strike price

On one hand the result of the transaction on options would not be booked correctly and on another hand the purchase or sale of the underlying would not be done to the market value, which leads to a distortion of subsequent transactions on the underlying such as sales or value adjustments.

Both of these errors make the calculation of performance for the options and the underlying impossible.

ePOCA: optimal assistance of the user

Our software for securities accounting and reporting optimally assists the user with the booking of options.

- Every option can be defined as a separate asset.
- Purchases and sales of options are booked just like purchases and sales of non-derivative assets.
- Short sales and buybacks of options are booked just like short sales and buybacks of non-derivative assets.
- The expiration without value of options is booked with a specific transaction which automatically transfers the book value of the options to a realized gain or loss.
- The exercise of options is easily booked. First the purchase or the sale of the underlying is booked to its market value. Then, ePOCA calculates the difference between the market value and the exercise value (strike) on a suspense account. Finally the exercise of the options is booked. ePOCA calculates automatically the realized gain or loss by settling the previously charged suspense account.

Performance

This way of booking options is the only correct one allowing a calculation of the performance where underlying and options are separated. It is then easy to derive the investment reporting directly from the accounting data, without any supplementary effort and without discrepancy with the accounting.

Link to our website
www.chsoft.ch