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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 expiration 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 expiration 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.

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1. Booking of purchased calls

After having purchased calls we have a positive or "long" position of these calls. Such a transaction is booked with a normal "P" (purchase) transaction. The final outcome can be one of the three following business cases:

- The calls are sold
- The calls expire without any vale
- The calls are exercised

Sale

The calls are sold; the accounting of this is booked with a normal "S" (sale) transaction, resulting in a realized gain or loss on calls, clearly visible on the corresponding (normally specific) 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. This business case is booked with the "EXP" (expiry) transaction. The position of the calls is closed out and the book value of the calls is lost, and is booked as a realized loss on calls.
Some banks do not announce the expiry of options with a corresponding bank advice.

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 closing of the calls. The possibility to buy the underlying at 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 book 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 purchase of the calls with the "P" transaction is simple: the holdings of the options (COST account) is debited with USD 15'000 x 2.20 = 33'000 and the bank account is credited with the same amount.

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COST OPTIONS	
33'000	

BANK	
	33'0

Exercise of the calls on the 20.01.2005

The purchase of the underlying is booked first with the "P EX" (purchase exercise) transaction. The transaction is not booked with the strike price USD 24.50 of the underlying but with its market price of USD 25.86. We obviously fill the settlement amount with the effective amount paid for the purchase of the underlying stocks. The COST account of the stocks is debited with USD 15'000 x 25.86 = 387'900, which is the **market value** of the stocks bought. The bank account is credited with USD 15'000 x 24.50 = 367'500, which is the amount paid for the purchase of the stocks. The difference of 20'400 (= 387'900 – 367'500) is booked on a suspense account. This amount has nothing directly related to the purchase of the stocks, but is caused by the calls. It must therefore be moved to the transaction on the calls. This is the role of the suspense account. This produces the following booking set:

COST STOCKS	
387'900	

BANK	
	367'50

SUSPENSE	
	20'400

Then the exercise of the calls is booked with the transaction "EP" (exercise position), with reference to the previous "P EX" transaction. The holdings account (COST) of the options is credited with USD 33,000, which is the book value of the exercised calls (the calls are closed out). The amount posted to the suspense account with "P EX" is shifted to the "EP" transaction by closing the account, here it is USD 20'400. This results in a realized loss on the calls of USD - 12'600 (= 20'400 - 33'000). Here we give the corresponding booking record:

COST OPTIONS	
	33'000

LOSS OPTIONS	
12'600	

SUSPENSE	
20'4	

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. This business case is booked with the transaction "SHS" (short sale). The input is the same as for a normal sale. The final outcome can be one of the three following business cases:

- The calls are bought back
- The calls expire without any vale
- The calls are exercised by the buyer

Buyback

The calls are bought back and the booking is made with the transaction "RP" (repurchase). The booking results in a realized gain or loss on calls, clearly visible on the corresponding specific 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.

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Expiration without value

The calls reach their maturity without any value, the market price of the underlying asset being lower than the strike price. This business case is booked with the transaction "EXPN" (expiry negative position). The amount received from the short sale of the calls is the final result of the booking on calls and will be booked as a realized gain on calls.
Some banks do not announce the expiry of options with a corresponding bank advice.

Exercise

The short 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 closing of the calls. To have to sell the underlying to a lower price than the market price is due to the short calls 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 booking set of the "SHS" transaction is simple: the holdings account of the options is credited with EUR 10'000 x 1.00 = 10'000 and the bank account is debited with the same amount.

COST OPTIONS	
	10'000

BANK	
10'000	

Exercise of the calls by the buyer on the 21.03.2005

We first book the sale of the stocks with the transaction "S EX" (sale exercise). The transaction is not booked with the strike price of EUR 44, but with the market price of EUR 45.81. Of course, the amount actually received for the sale of the shares is entered as the settlement amount. The holdings account of the stocks is credited with EUR

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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 with EUR 10'000 x 44.00 = 440'000, which is the actually received amount for the sale of the stocks. The difference of -18'100 (= 440'000 – 423'500 - 34'600) is booked on a suspense account. This amount has nothing directly related to the sale of the stocks, but is caused by the calls. It must therefore be moved to the transaction on the calls. This is the role of the suspense account. This produces the following booking set:

COST STOCKS	
	423'500

GAINS ON STOCKS	
	34'600

BANK	
440'000	

SUSPENSE	
18'100	

Then the exercise of the calls is booked with the transaction "ENP" (exercise negative position), with reference to the previous "S EX" transaction. The holdings account (COST) of the options is debited with EUR 10'000, which is the book value of the exercised calls (the calls are closed out). The amount posted to the suspense account with "S EX" is shifted to the "ENP" transaction by closing the account, here it is EUR 18'100. This results in a realized loss on the calls of EUR - 8'100 (= 10'000 - 18'100). Note that the loss is independent from the book price of the underlying at the moment of the exercise. Here we give the corresponding booking set:

COST OPTIONS	
10'000	

LOSS ON OPTIONS	
8'100	

SUSPENSE	
	18'1

3. Booking of purchased puts

After having purchased puts we have a positive or "long" position of these puts. Such a transaction is booked with a normal purchase "P" transaction. The final outcome can be one of the three following business cases:

- The puts are sold
- The puts expire without any vale
- The puts are exercised

Sale

The puts are sold; the booking of this business case is made with the normal "S" (sale) transaction, resulting in a realized gain or loss on puts, clearly visible on the corresponding specific 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. This business case is booked with the "EXP" (expiry) transaction. The position of the puts is closed and the book value of the options will be booked as a realized loss on puts.
Some banks do not announce the expiry of options with a corresponding bank advice.

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

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have to book the sale of the underlying and the exercise, which will lead to the closing 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 booking set of the "P" transaction is simple: the holdings account of the options is debited with USD 3'000 x 1.65 = 4'950 and the bank account is credited with the same amount.

OPTIONS	
4'950	

BANK	
	4'950

Exercise of the puts on the 31.12.2005

We first book the sale of the stocks with the transaction "S EX" (sale exercise). The transaction is not booked with the strike price of USD 35, but with the market price of USD 33.40. Of course, the amount actually received for the sale of the shares is entered as the settlement amount. The holdings account of the stocks is credited with 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 with USD 3'000 x 35.00 = 105'000, which is the actually received amount for the sale of the stocks. The difference of USD 4'800 (= 105'000 + 1'800 – 102'000) is booked on a suspense account. This amount has nothing directly related to the sale of the stocks, but is caused by the puts. It must therefore be moved to the transaction on the puts. This is the role of the suspense account. This produces the following booking set:

STOCKS	
	102'000

LOSSES ON STOCKS	
1'800	

BANK	
105'000	

SUSPENSE	
	4'800

Then the exercise of the puts is booked with the transaction "EP" (exercise position), with reference to the previous "S EX" transaction. The holdings account (COST) of the options is debited with USD 4'950, which is the book value of the exercised puts (the puts are closed out). The amount posted to the suspense account with "S EX" is shifted to the "EP" transaction by closing the account, here it is USD 4'800. This results in a realized loss on the puts of USD - 150 (= 4'800 - 4'950). Here we give the corresponding booking set:

COST OPTIONS	
	4'950

LOSSES ON OPTIONS	
150	

SUSPENSE	
4'	

Note that despite their exercise, the transaction on puts (purchase and exercise) resulted in a 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. This business case is booked with the transaction "SHS" (short sale). The final outcome can be one of the three following business cases:

- The puts are bought back
- The puts expire without any vale
- The puts are exercised by the buyer

Buyback

The puts are bought back and the booking is made with the transaction "RP" (repurchase). The booking results in a realized gain or loss on puts, clearly visible on the corresponding specific 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 puts reach their maturity without any value, the market price of the underlying asset being higher than the strike price. This business case is booked with the transaction "EXPN" (expiry negative position). The amount received from the short sale of the puts is the final result of the booking on puts and will be booked as a realized gain on puts.
Some banks do not announce the expiry of options with a corresponding bank advice.

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 closing 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 booking set of the "SHS" transaction is simple: the holdings account of the options is credited with USD 2'500 x 1.00 = 2'500 and the bank account is debited with the same amount.

COST OPTIONS	
	2'500

BANK	
2'500	

Exercise of the puts by the buyer on the 30.06.2005

We first book the purchase of the stocks with the transaction "P EX" (purchase exercise). The transaction is not booked with the strike price of USD 80, but with the market price of USD 74.20. Of course, the amount actually paid for the purchase of the shares is entered as the settlement amount. The holdings account of the stocks is debited with USD 2'500 x 74.20 = 185'500, which is the **market value** of the purchased stocks. The bank account is credited with USD 2'500 x 80 = 200'000, which is the amount really paid for the purchase of the stocks. Thie difference of – 14'500 (= 185'500 – 200'000) is booked on a suspense account. This amount has nothing directly related to the purchase of the stocks, but is caused by the puts. It must therefore be moved to the transaction on the puts. This is the role of the suspense account. This produces the following booking set:

COST STOCKS	
185'500	

BANK	
	200'00

SUSPENSE	
14'500	

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Then the exercise of the puts is booked with the transaction "ENP" (exercise negative position), with reference to the previous "P EX" transaction. The holdings account (COST) of the options is debited with USD 2’500, which is the book value of the exercised puts (the puts are closed out). The amount posted to the suspense account with "P EX" is shifted to the "ENP" transaction by closing the account, here it is USD 14'500. This results in a realized loss on the puts of USD - 12'000 (= 2'500 - 14'500). Here we give the corresponding booking set:

COST OPTIONS	
2'500	

LOSSES ON OPTIONS	
12'000	

SUSPENSE	
	14'5

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 results 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 to 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.

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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.